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Scholastic's Magazine for Today's Elementary Classrooms

TEACHING and computers

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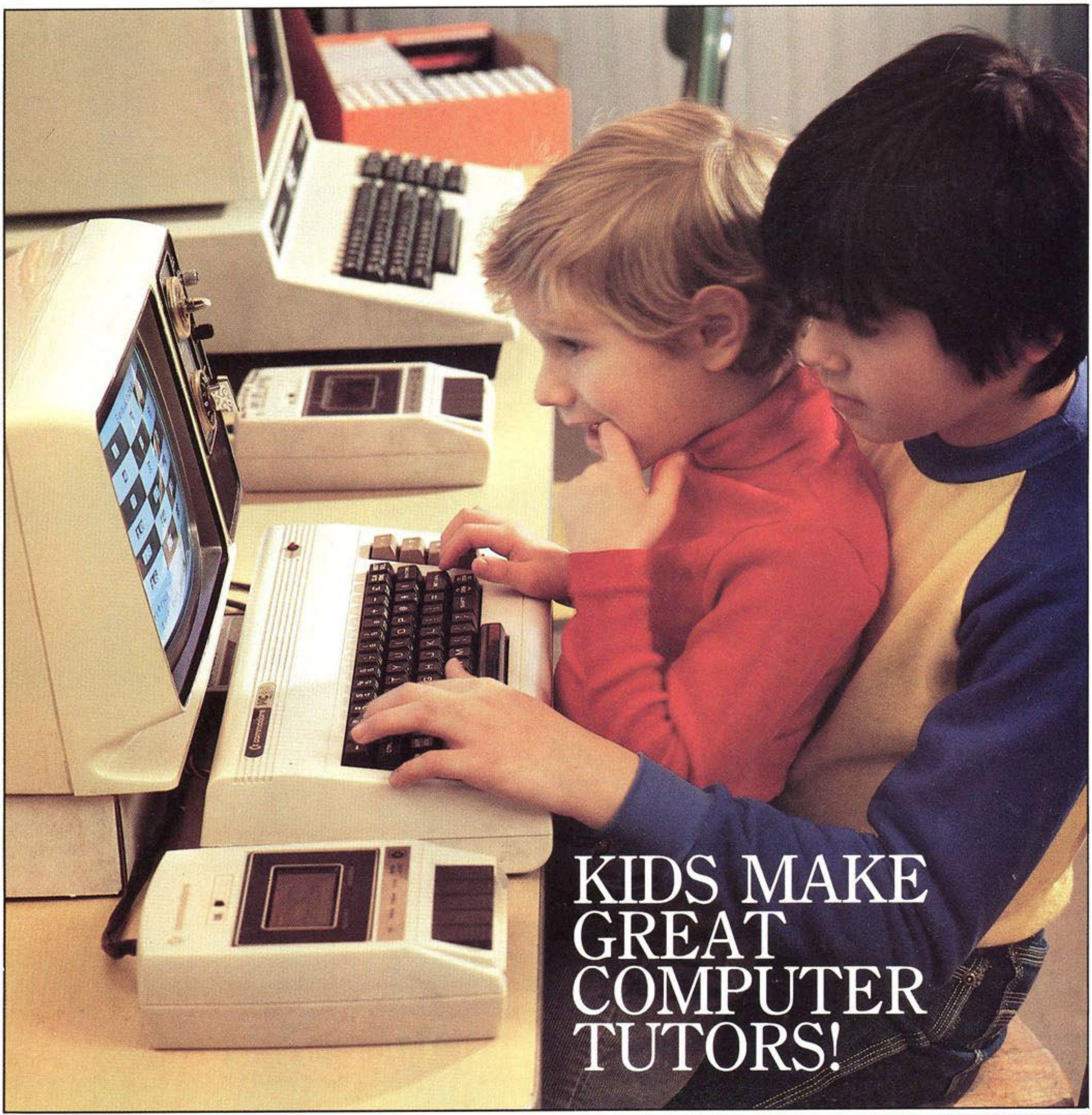

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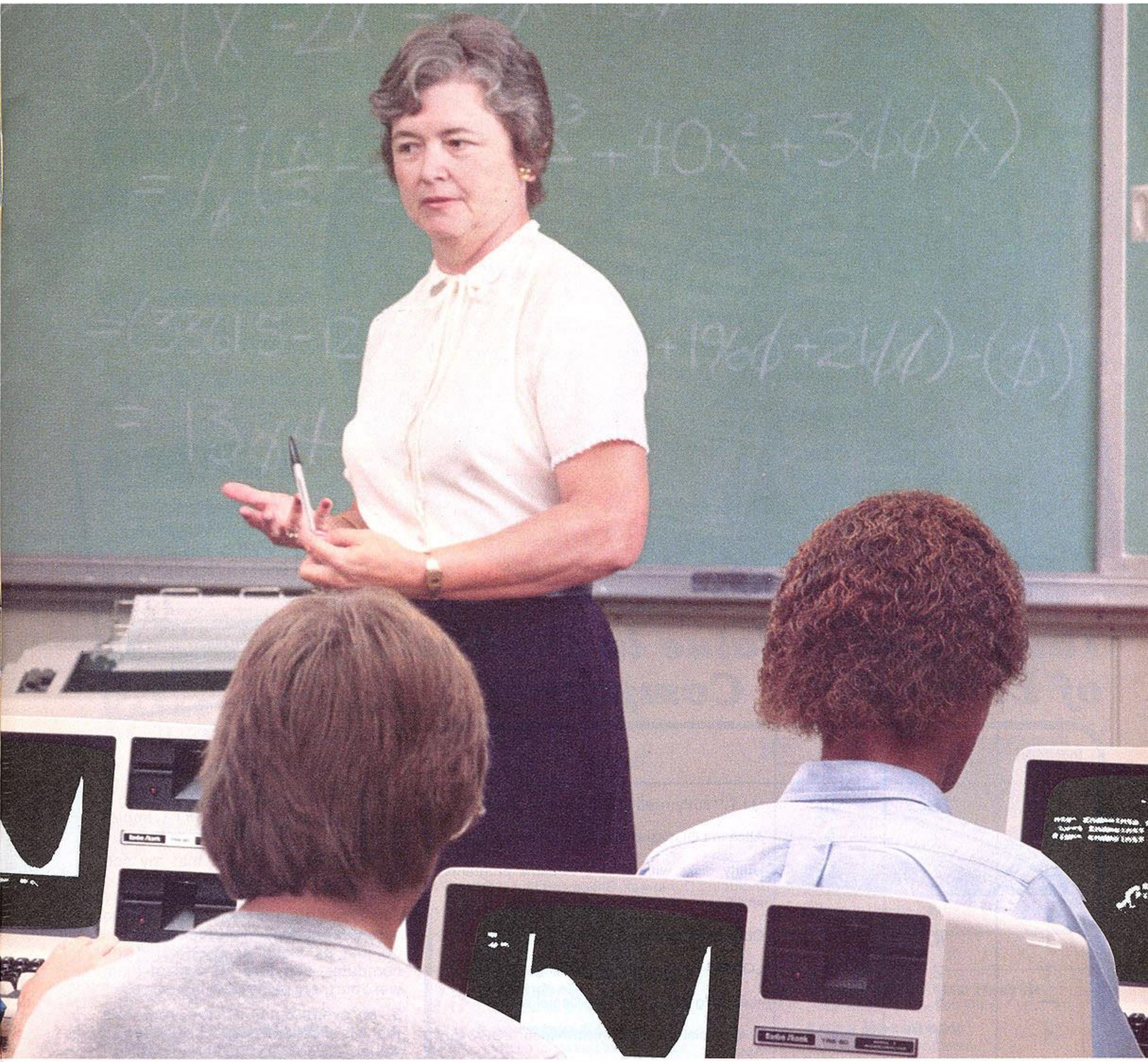

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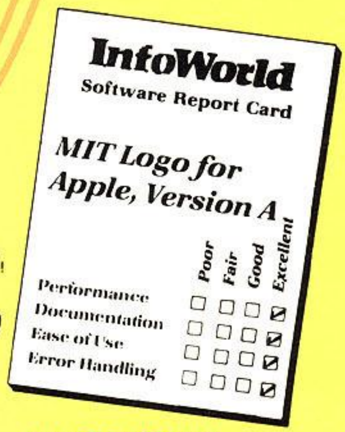

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TEACHING and computers™

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February 1984 Vol. 1, Issue 5

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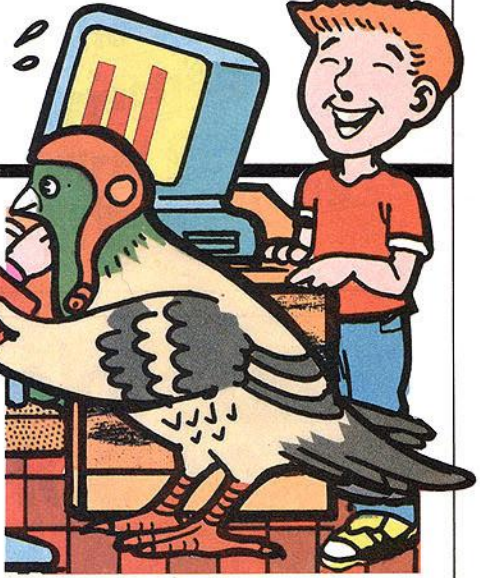

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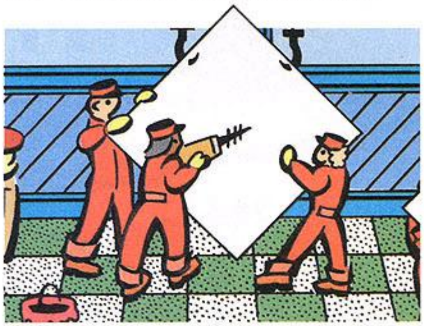

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COVER PHOTOGRAPH BY RICHARD HUTCHINGS

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FROM THE EDITOR
Put Byte in Your Valentines

Tired of the same old store-bought valentines? Have your students make more interesting ones of their own this year. Give them markers and colored paper, and tell them to design cards with "computerized" verse. Here's a possible rhyme:

My heart is like a disk.
Handle it with care.

Or how about:

Valentine you are the one;
I need your love to make me RUN.

There's no ESCaping the puns once students get warmed up, because the possibilities for wordplay are ENDless! *Teaching and Computers*' art designer Susan Abbott and illustrator Georg Whiting have caught the "bug." That's Susan and Georg in the picture below, exchanging valentine data. For more suggestions on computerizing your valentines, see **Idea of the Month**, page 8.

Valentine's Day isn't the only cause for celebration this month. February is also Black American History Month. Assistant editor Lorraine Hopping has written a short program listing on four great black Americans: Frederick Douglass, Harriet Tubman, Ida B. Wells, and Martin Luther King, Jr. Students will learn all about these great Amercians as they play the program. Lorri has included directions on how students can add facts about other black Amercians to the program, too. See **Program of the Month**, page 46.

T&C's *art designer Susan Abbott exchanges "valentine data" with illustrator Georg Whiting.*

Starting in this issue, we have a new column that's for kids only. Appropriately titled, **Kid's Page**, page 45, it's a worksheet you can tear out, run off, and distribute to students. It contains computer jokes, simple programs to try, and a cartoon about Nibbles, a dog who wouldn't be seen without his computer.

Another new service we are providing readers is a **Conversion Chart** on the last page of each issue. The chart will contain directions on how to convert program listings that appear in the main features into listings for use on different computer models.

There's other handy information in this month's *T&C* as well.

Say Goodbye to Hunt-and-Peck, page 28, provides you with all the material you'll need to teach touch typing. Follow the article's three instructional steps, and you'll never hear "Mrs. Jones, I can't find the *e* key!" again.

In **Mission: Mind Stretch**, page 24, computer instructor Susan Friel dispels the myth that good math software is nonexistent. She selects three rather unusual programs and tells how they can develop math problem solving.

Don't miss assistant editor Lesli Rotenberg's report on peer tutoring, **My Computer Teacher Wears Sneakers**, page 22. "Teachers across the country are discovering that students can make great computer tutors," Lesli says.

Enjoy the issue! ■

Mary Dalheim
Editor

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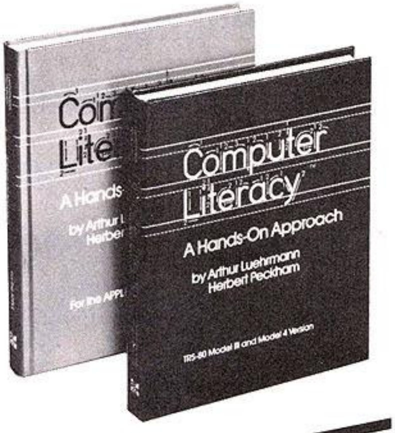

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LETTERS

T&C Readers Respond

Stuck in the Middle

Secondary computer materials are too advanced for my seventh and eighth graders. That's why I was so excited to hear about the publication of* Teaching and Computers. *Now I see on the cover that you are for elementary grades only. It looks as though we junior high teachers are stuck in the middle!

Dennis Patterson
Chicago, IL

Editor's Reply:
Don't despair! Just because the cover says "Scholastic's Magazine for Today's Elementary Classrooms," doesn't mean junior high school teachers can't use *T&C*, too!

We've heard from many junior high teachers who say that most of the major features, as well as columns like Program of the Month and Logo Notebook, are suitable for, or at least adaptable to, their grade levels.

Software Shortage

Our school has just purchased a microcomputer. We're ready to purchase some software now, but so far, most of the software we've seen has been very disappointing. Can you recommend some good programs?

Jenny Alberts
Richmond, VA

Editor's Reply:
You've come to the right place for help! Turn to *T&C*'s monthly department, Software Showcase. It lists teacher-recommended, classroom-tested software programs.

Molly Watt, our Question Corner author, often recommends programs in her column. And the column called Computing in the Content Areas gives suggestions and activities on how to incorporate good programs into your curriculum.

Pay close attention to our features, too. "Say Goodbye to Hunt and Peck" on page 28 of this issue, for example, lists several typing software programs recommended by teachers.

One more thing: when you do come across good software, let us know. We'd love to pass on the info!

Program Goof

Please take this as a love letter . . . but as an angry love letter! I adore your new magazine, but in the October issue of* T&C, *you listed modifications for a program entitled Around the World that made me less than happy!

Having an Atari 800, I typed in the program with the given modifications and ran it, but kept getting "ERROR 9" messages.

What should I do?

Ann W. Koelemay
Plover, WI

Editor's Reply:
We neglected to include additional DIM commands required for Atari programs that use string variables.

To make up for our error, we're offering a free package of Atari program listings for major programs listed in the magazine so far. To participate in our offer, Atari users should send a self-addressed, stamped envelope to Atari Program Listings, *Teaching and Computers*, 730 Broadway, New York, NY 10003.

Correction

In the article "Put Parents on Your Computing Team" (October 1983), we neglected to include the fact that the idea of presenting an "Academy Awards" disk containing the best of students' computer-generated pictures was originally developed at the Learning Research and Development Center at the University of Pittsburgh in Pennsylvania, during a summer computer literacy program taught by Leslie F. Thyberg and Sharon Lesgold. ■

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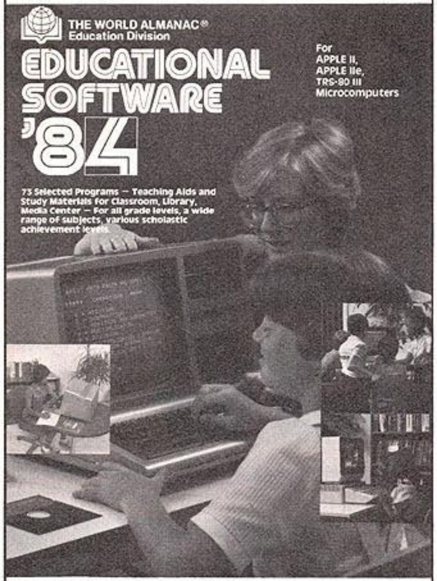
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IDEA OF THE MONTH

Computerize Your Valentines!

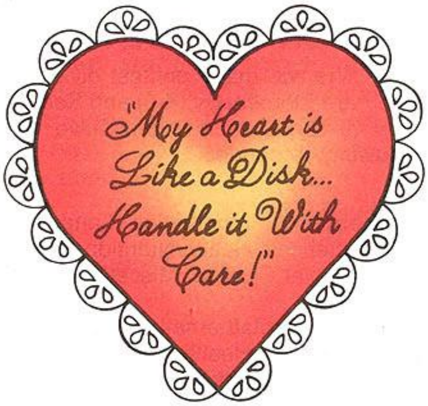
By Tom Conklin and Wendy Caron

Valentine messages have always been a means of expressing love and friendship. By using computer terms, students can write these messages in a new way.

Computer use has added many new meanings to words. *Boot* no longer means just the covering to protect your feet from the snow. Instead, it can mean to load a program into the computer. *Chips* are more than just snacks to serve with dip. In the computer world, they are miniature electronic circuits.

To start your students off, list other computer terms on the chalkboard. Let the students choose a word and think about what it means when referring to the computer.

Instruct your students to write a short sentence about their valentine, using the computer word they choose. For instance, if a student chooses the word *disk*, he or she knows that disks must be handled with care. The student may write a valentine like this:


"My Heart is Like a Disk... Handle it With Care!"

This exercise will probably take some brainstorming, so encourage your students to bounce ideas off each other. At first students may not understand each other's messages, but if the computer words are used correctly, you'll see smiles of understanding gradually creep over their faces.

This exercise is not limited to words. Remind your students of some of the abbreviations used with the computer, such as RAM and ROM. Your students should think about what these letters stand for to use them in their messages. Here's one message using ESC: "You can't ESCape.... So RETURN to me!" This message uses a computer term and a computer abbreviation. Encourage your students to use as much computer jargon as possible in their valentine messages.

If your students get stuck, here are some samples you can share with them:

When my CHIPS are down, you are there!

INPUT love; OUTPUT happiness.

Valentine, you are the one;
I need your love to make me RUN.

You may be VARIABLE,
But I think you're marry-able.

What's a valentine message without a card on which to present it? Once your students have either created or selected a saying, they should design a card to go with it. On the next page are two valentines we created. Students may wish to make these valentines or similar ones.

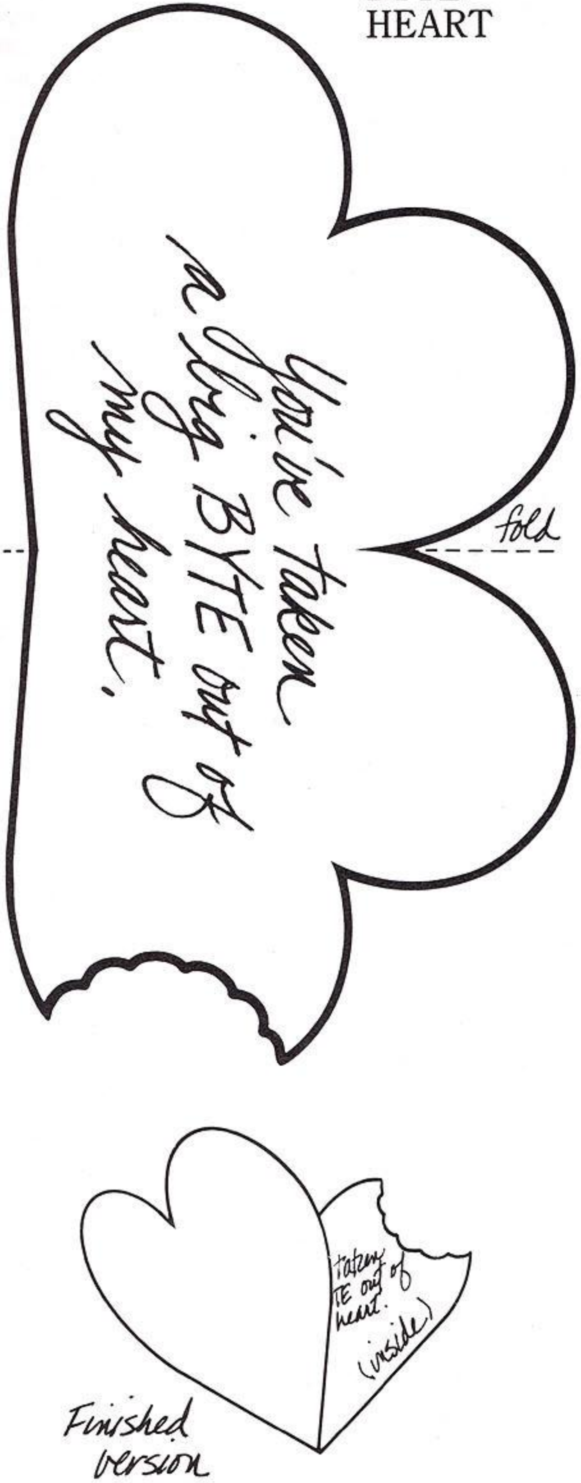
To assemble the Ram, color and cut out the ram's head and matching heart. Glue the ram's neck to the back of a small juice can that has been covered with colored paper. Position the ram's arms around the can, as if hugging it, and glue the heart to the arms where marked. Fill the can with nuts and raisins or valentine candy.

To make the Byte Heart, color and cut pattern. Fold in half where indicated. Now it's ready to be sent to your computer valentine. ■

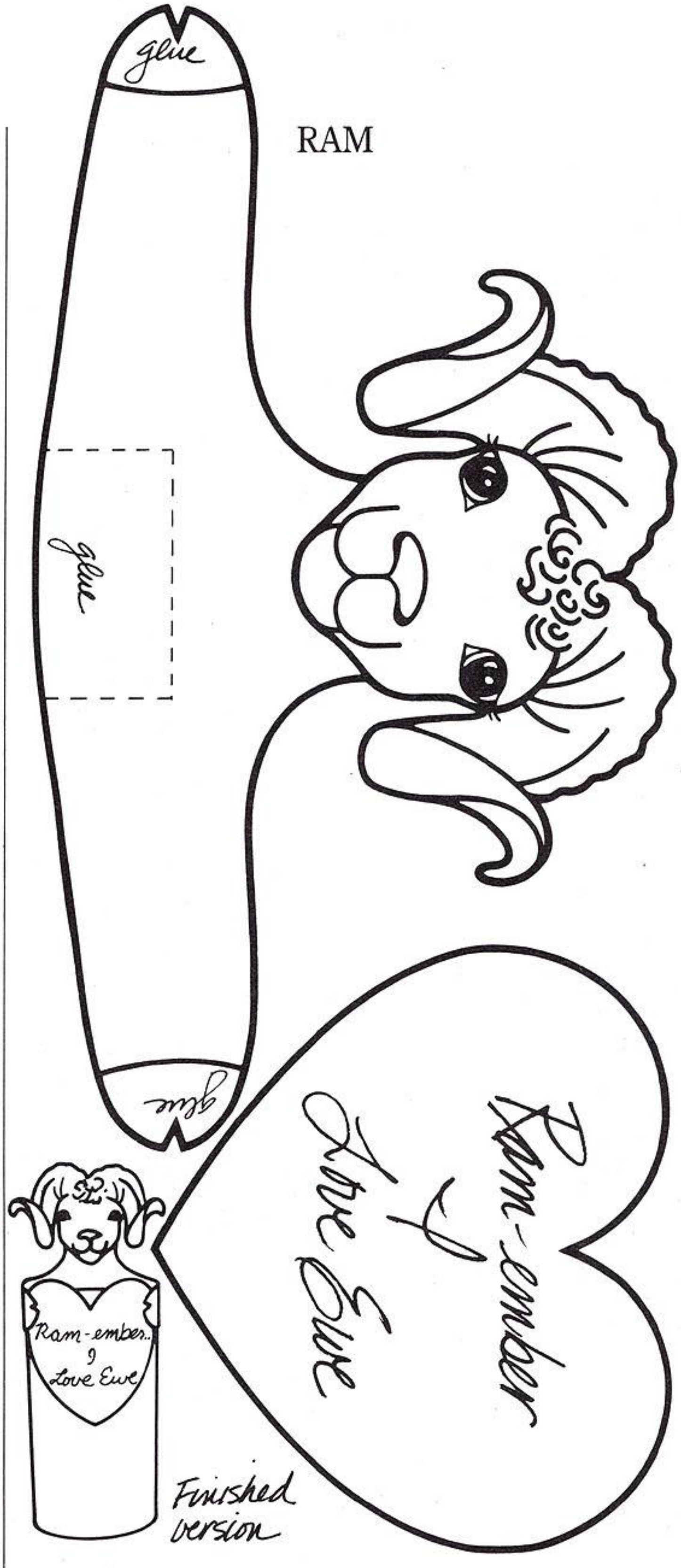
Tom Conklin is assistant editor for *DynaMath* magazine. ***Wendy Caron*** is editorial assistant for *Teaching and Computers.*

Clare Sieffert

BYTE HEART


You're taken a big BYTE out of my heart.
fold
taken TE out of heart.
(inside)
Finished version

RAM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glue
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UPDATE

News for Computer-Using Teachers

Reports Show Less Programming Taught in Poor Schools

Two recent reports show that while students in affluent schools spend much of their computer time learning to program, those in poorer schools are using computers primarily for drill and practice.

A report prepared by the Policy Studies Associates, Inc. (P.S.A.) for the U.S. Education Department finds that Chapter I students are more likely to use computers for drill and practice than to be taught programming. A survey conducted by the Center for Social Organization at Johns Hopkins University echoes the P.S.A. report, finding that while 49 percent of the schools with predominantly white students use computers "intensively" for programming, only 10 percent of the schools with mostly minority students use the computer in the same capacity.

Pittsburgh Spends $900,000 on Computerized Management

The Pittsburgh Public Schools plan to spend $900,000 on a computerized system that will help educators perform administrative and classroom management tasks for the city's 45,000 public school students. Carnegie-Mellon University helped develop this computer system to meet the district's educational needs.

Kraft Announces Kideo Game Contest

Kraft Foods is sponsoring The Kideo Game Contest, in which contestants are to write computer games that can be used to teach three- to eight-year-olds about nutrition. Entrants must be 18 or under and residents of the United States. Prizes include trips to Disney World and New York, as well as gift certificates for computer equipment. The deadline for entries is March 31, 1984; the winners will be announced on May 1, 1984.

Georg Whiting

To receive the Official Rules and Regulations, send a self-addressed, stamped #10 envelope to The Kraft Kideo Game Contest, P.O. Box 845, South Holland, IL 60473.

Micro-Ed to Donate $10,000 Worth of Educational Programs

Micro-Ed Incorporated has announced it will donate up to $10,000 worth of educational programs to any elementary school library system that demonstrates effective communication channels between the home and school. Such cooperation could include helping families establish guidelines in purchasing educational software for the home or setting up a free lending library of educational software for families to use.

For more information on specific qualifications for this grant, contact Thorwald Esbensen, Micro-Ed, P.O. Box 24156, Minneapolis, MN 55424, or call 800/MICRO-ED.

Minnesota Requires Technology Plan

The Minnesota legislature has established the Technology and Educational Improvement Act to help public schools develop, train staff, and purchase high quality software. The act requires districts to set up local advisory committees composed of parents, community members, and faculty to determine technology goals and ways of implementing them in management and instruction. The legislature plans to spend $5.8 million—$.75 for each student enrolled in the 1982–83 school year—to determine and implement these goals. ■

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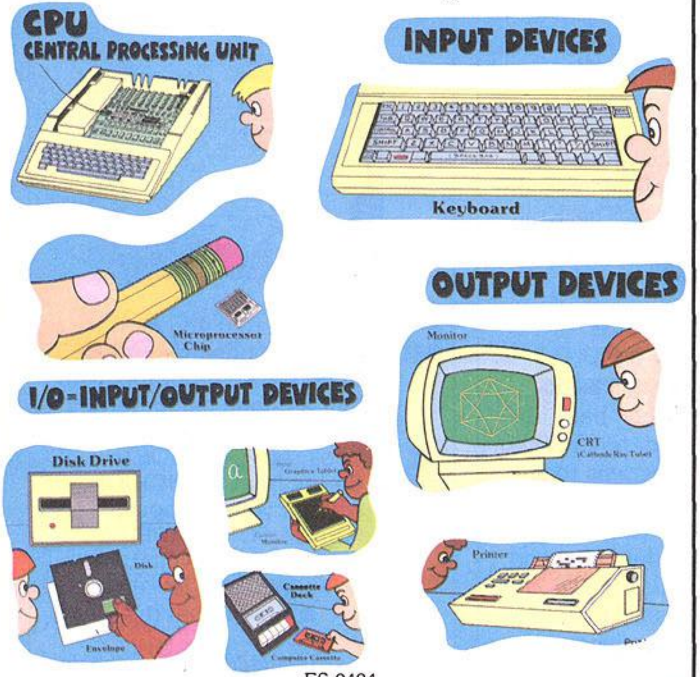
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I/O=INPUT/OUTPUT DEVICES
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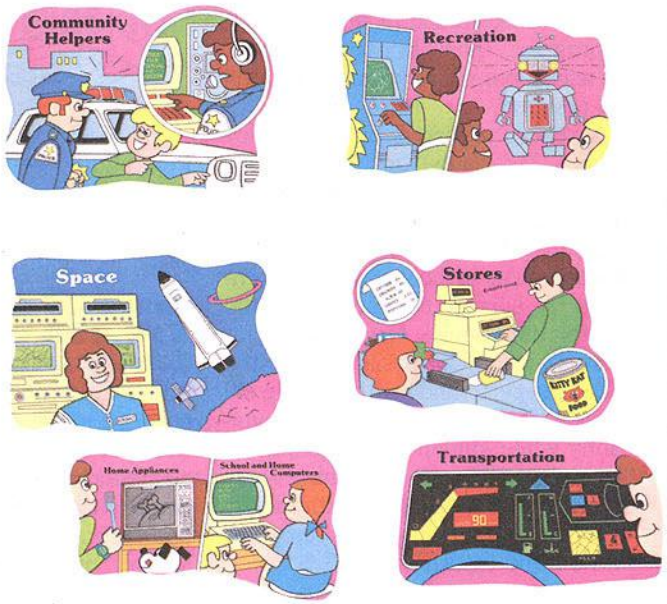
FS-9424

Computers Help Us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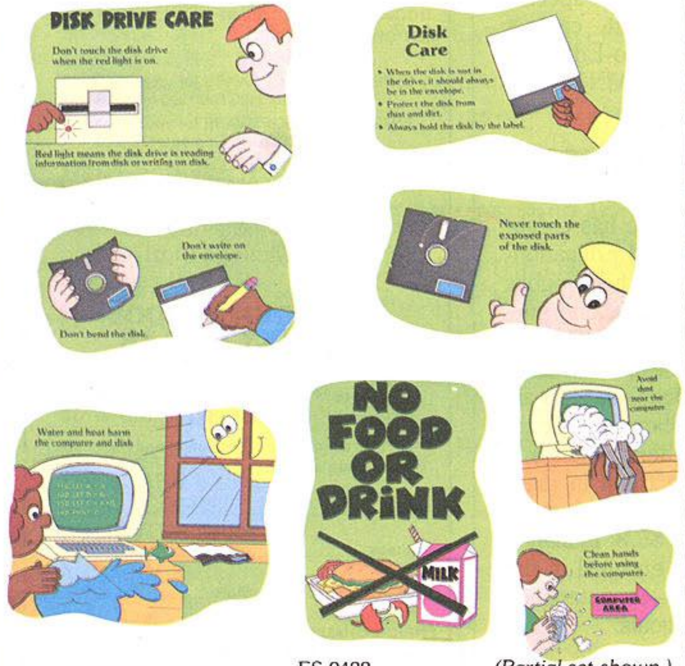
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IN MY OPINION

The Computer: Opportunity for Change

By Bobby Goodson

During the past few years, I have been able to visit computer-using schools in many areas. Going from school to school, I notice that the introduction of computers has changed schools far beyond the influence of the equipment itself. In fact, computers are a breath of fresh air for education. They provide a wonderful opportunity for change.

Computers make us ask questions. They make us ask simple questions like: How do I use it? and What will it do? But they also inspire more important questions like: How can I use this new technology to become a better teacher?

To answer these questions, teachers must search outside their classroom, their school, and sometimes, their district. This search leads to better communication between the teachers, schools, districts, and best of all, between the schools and communities.

Computers open communication lines. They open communication lines that have been closed for many years. Take, for example, two school districts side by side that haven't talked for years. Suddenly, they have a reason to contact one another and ask questions like: What computers are you using? What software do you suggest? This contact leads to cooperative efforts. In California, it led to teacher training on a regional, rather than a district level.

More important, computers open communication between schools and the community. The need for support in starting a computer program in most communities has sparked fund-raising efforts, parent volunteer programs, and the cooperation of local businesses.

Computers help us understand students. The process of learning to use the computer refreshes our memory of the frustrations and joys of learning something totally new. This experience helps us understand our students, who are presented with new and challenging ideas every day.

Computers make us evaluate our curriculum. Computers give us a new concept (computer awareness) to teach. But they also give us a reason to look at what we're teaching in a fresh light. Because of the sophistication of computer technology, we can use software to present complex ideas in a simplified form. For example, in the past we couldn't teach young, inquisitive children about physics because they could not grasp the fundamental math concepts. But a computer can perform the computation silently, while it demonstrates physical concepts with images that children understand. This satisfies curious little minds and keeps them from getting false information until they are ready to perform the equations themselves.

Computers give us a new method of teaching. But computers are more than a new unit to add to the curriculum. If we use them most effectively, computers become part of every subject matter and every unit. The computer's ability to file information turns it into a tool for social studies. And its ability to manipulate words allows children to learn creative writing and editing skills on the keyboard before they can handle a pencil.

What I see in the schools I visit gives me reason to rejoice. I see the computer opening windows for education. And I see teachers taking advantage of the opportunity to breathe fresh air. Keep up the good work! ■

Bobby Goodson is the computer resource teacher at Cupertino School District in Cupertino, California. Ms. Goodson is also a member of the advisory board of *Teaching and Computers.*

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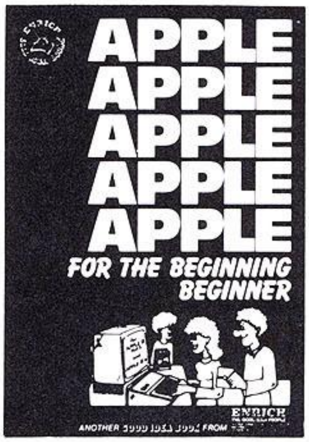

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QUESTION CORNER

By Molly Watt

In My Own Words

Dear Molly: I want to use the computer to help my students practice their spelling words. But my school's spelling software doesn't allow me to enter my own lists. Are there any programs that do?

John Saidnawey
Albuquerque, NM

I know several excellent spelling programs that let you input your own spelling lists.

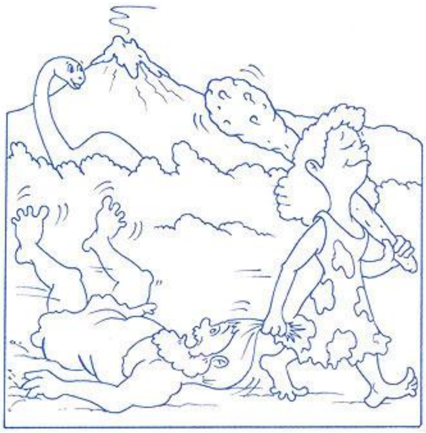
The first two programs require a cassette control device (CCD) that connects an Apple computer to a cassette tape recorder. The teacher records the spelling words on the tape recorder and students enter their responses in the computer.

One of the programs, *Spelling Package,* waits until students spell each word correctly before moving to the next word. When the lesson is complete, the computer shows two lists. One list shows the words spelled correctly. The other shows the words spelled incorrectly by the student with their correct spellings.

The other package, *Create-Spell It,* is similar. It can save records for 100 students.

There are similar programs for other machines. If you have a TRS-80 computer, you may want to preview *Customized Flash Spelling.* It contains one spelling lesson, but teachers can enter their own lists for any grade level. If you have an Atari computer, *Do It Yourself: Spelling* is a new program that lets you make your own oral spelling list. It comes with a list of 1,950 words that everyone should know by sixth grade.

Scramble Spell is a spelling program for the Commodore PET that takes a different approach. Students practice unscrambling the 100 most commonly misspelled words. This is a good program for students to work on together. □



Georg Whiting

Down With Macho Shoot 'Em Up Games

Dear Molly: Aren't there any adventure games with strong girls and no violence?

Brenna Katz
Evanston, IL

A wonderful new line of software is available from a company called Rhiannon Computer Games for Girls. The company was started by educators who share your desire to create adventure games that are in harmony with educational values and planned curriculum goals.

My favorite is *Jenny of the Prairie.* It is the story of a pioneer girl who becomes separated from her wagon train and must face the winter alone. Players help Jenny find food and shelter and stay safe from danger. □

Stop The Clock

Dear Molly: Our school has one computer. I get to use it in my room for 40 minutes every day. I have 25 students in my class. How can I get the most out of our time on the computer?

Marvin Stanley
Nashville, TN

Here's an idea. Divide your class into five groups with five students in each group. Assign each group a leader and a day at the computer.

Now develop ideas for problem-solving activities at the computer. You only need to create one task a week.

During the first week, have each group take surveys and use the computer to create professional graphs of the data. Have them program the computer to alphabetize a list of their favorite library books.

Have them use the computer for word processing the second week. Each group could report on a school event or write a page about a class project.

Offer simple programming problems in BASIC or Logo for the third week's activity.

Using this method, you provide students with a group experience and a variety of computer challenges on a weekly basis. □

Where's the Software for My 64?

Dear Molly: I have a Commodore 64 computer. I am having trouble finding software to use with my class. Do you have any suggestions?

Mindy Komen
St. Petersburg, FL

All Commodore 64 users should know about a wave of educational software that was recently translated for the Commodore 64.

For starters, most of the software published by Spinnaker is now available for the Commodore 64. This includes such favorite software programs as *Snooper Troops, Facemaker,* and *Delta Drawing.*

Counterpoint Software has also translated its Early Games series of programs for the Commodore 64. These include *Early Games for Young Children, Early Games Music, Fraction Factory* and *Matchmaker.* The Minnesota Educational Computing Consortium (MECC) is now converting selected programs, too.

Micro-Ed, Inc. has published more than 350 educational software programs for the Commodore 64. Another company, Microgram, has about 200 educational titles for the

Commodore 64.

And the Commodore 64 version of Logo is one of my favorite versions. It is very close to the original M.I.T. version and also similar to the Terrapin and Krell versions.

Ask about Commodore public domain software at your local computer store. There are 27 disks currently available for the Commodore 64 with 12–16 programs on each. The disks cost $6.95 each and may be copied. They are also available to users of the CompuServe network. ☐

Software Recommended By Molly:

Spelling Package
Hardware: Apple
Grade Level: Grades 2–Adult
Price: $99.95 includes cassette control device
Contact: Teaching Tools Microcomputer Services, P.O. Box 50065, Palo Alto, CA 94303; 415/493-3477.

Create-Spell It
Hardware: Apple
Grade Level: Grades 2–Adult
Price: $29.95 for program; $79.95 for cassette control device
Contact: Hartley Courseware, Inc., P.O. Box 431, Dimondale, MI 48821; 616/942-8987.

Customized Flash Spelling
Hardware: TRS-80 Model I, III; Apple
Grade Level: Grades 2–Adult
Price: $49.50 for cassette or disk
Contact: Random House School Division, Dept. 9103, 400 Hahn Rd., Westminster, MD 21157; 800/638-6460.

Do It Yourself: Spelling
Hardware: Atari (16K)
Grade Level: Grades 1–12
Price: $19.95
Contact: Program Design Inc., 95 E. Putnam Ave., Greenwich, CT 06830; 203/661-8799.

Scramble Spell
Hardware: Commodore PET (16K cassette)
Grade Level: Grades 3–6
Price: $9.95
Contact: J.L. Hammett Company, Hammett Place, P.O. Box 545, Braintree, MA 02184; 800/225-5467.

Jenny of the Prairie
Hardware: Apple
Grade Level: Grades 3–6
Price: $34.95
Contact: Rhiannon Computer Games for Girls, 3717 Titan Drive, Richmond, VA 23225.

Publishers Recommended By Molly:

Spinnaker Software
215 First Street, Cambridge, MA 02142; 617/868-4700.

Counterpoint Software
4005 West 65 St., Minneapolis, MN 55435; 800/328-1223.

Micro-Ed, Inc.
P.O. Box 24156, Minneapolis, MN 55424; 612/944-8750.

Microgram
Box 2146, Loves Park, IL 61130; 815/965-2464.

Rhiannon Computer Games for Girls
3717 Titan Drive, Richmond, VA 23225.

Do you have a computer question? Send it to Teaching and Computers' *expert, Molly Watt. Molly teaches computer education courses at Keene State College in Keene, New Hampshire. Write her in care of* Teaching and Computers, *730 Broadway, New York, NY 10003.* ■

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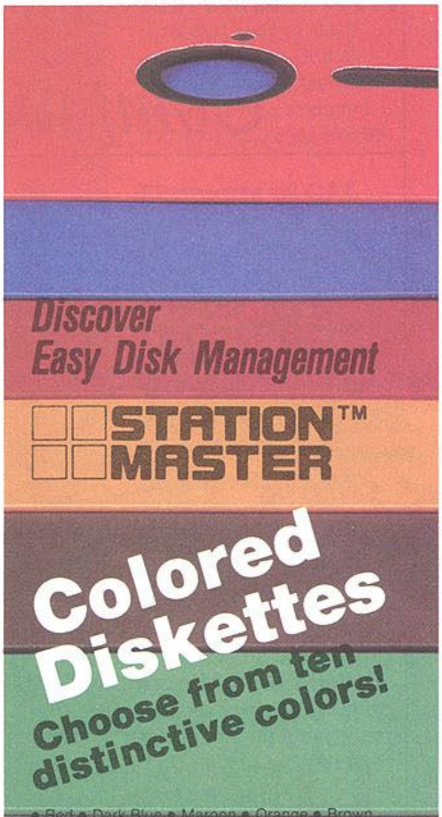

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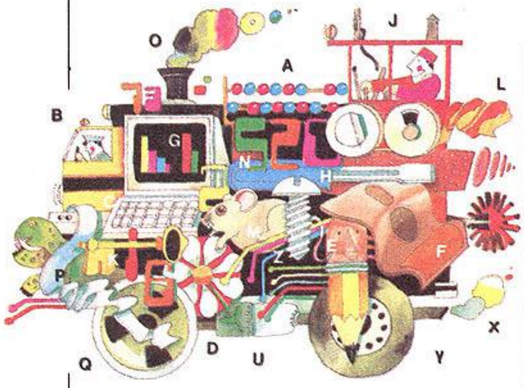
Computer Dictionaries to Look Up

By Judy Simmons



A Dictionary of Computer Words *has witty illustrations on every page.*

Here's a look at the new dictionaries, workbooks, and activity books available to help you and your students learn basic computer terms and skills.

Computer Dictionaries

Strange as it may seem, computer languages are now considered to be foreign languages. And, as with any new language, a dictionary can be a necessary and handy reference tool.

Just about any computer term can be found in Patricia Conniffe's ***Computer Dictionary*** (Scholastic; 1984; $2.95; Teacher's Guide, $1.50). Thanks to the illustrations, language, and format, it can be used at both the secondary and elementary levels. Clear definitions and pronunciations are given for more than 500 terms, with helpful cross-references.

Another good dictionary, but perhaps not as well suited for elementary use, is ***Webster's New World Dictionary for Computer Terms*** (Simon & Schuster; 1983; $5.95), compiled by Laura Darcy and Louise Boston. This pocket dictionary is compact, yet easy to read, with 2,500 basic computer terms. It wouldn't hurt to have a copy of this one in your library for your computer whiz kids.

Still another option is ***A Dictionary of Computer Words*** (Dell/Banbury Publishing Co.; 1983; $4.95), by Robert W. Bly. It defines more than 400 words and phrases, but not as thoroughly as Conniffe's book. Written for the sixth grade level, it works well with older students. Familiar, everyday examples explain unfamiliar computer jargon. Simple, witty illustrations by Jack Freas appear on practically every page.

Computer Workbooks and Activity Books

Add these new workbooks and activity books to your list and you'll be adding fun and challenge to your lesson plans.

Basic Computing (Scholastic; 1984; $2.95; Teacher's Edition, $3.50) is a set of workbooks for grades one through six. Each 64-page workbook teaches the essential skills for computer literacy, without requiring access to a computer. The exercises give students a firm foundation so when they do get hands-on experience with the computer, they feel confident. The layout is attractive and inviting, making learning about computers fun! The teacher's editions list all possible student answers, and the "Notes for the Teacher" on the inside, front cover provide good instructional tips.

Stan Harcourt has written ***Computer Keyboard Mastery*** (Edward Arnold Publishers; 1983; $9.95) to help students master the computer keyboard. Just like the old typing textbooks, the workbook introduces first those keys used most often.

Students progress at their own pace, depending on their accuracy. Harcourt's method may not be as much fun as the arcade-like typing programs, but he provides a basic, thorough approach to conquer the keyboard.

Sandra Markle, in ***Kids' Computer Capers*** (Lothrop, Lee & Shepard Books; 1983; $6.95), uses puzzles, games, activities, and mini-mysteries to present the history, operations, and programming of computers—some of the topics kids are not eager to read about on their own.

From the very first page, students will be hooked. The average intermediate student should find the format and content appealing. Stella Ormai's amusing illustrations add to the upbeat approach.

If you're just beginning to use computers in your classroom, Beverly Hunter's ***My Students Use Computers*** (Reston Publishing Co.; 1983; $16.95) is a good place to start. Hunter's book provides K–8 teachers with computer literacy learning activities to incorporate into the traditional classroom.

The seven chapters include 90 lesson plans with specific objectives. Each lesson plan gives prerequisites, class management information, teacher notes, and related activities. The only drawback to the book is that some of the activities require specific software programs.

Publishers' Addresses

Edward Arnold Publishers, Ltd., 300 North Charles Street, Baltimore, MD 21201

Dell/Banbury Publishing Co., 37 West Avenue, Wayne, PA 19087.

Lothrop, Lee & Shepard Books, 105 Madison Avenue, New York, NY 10016.

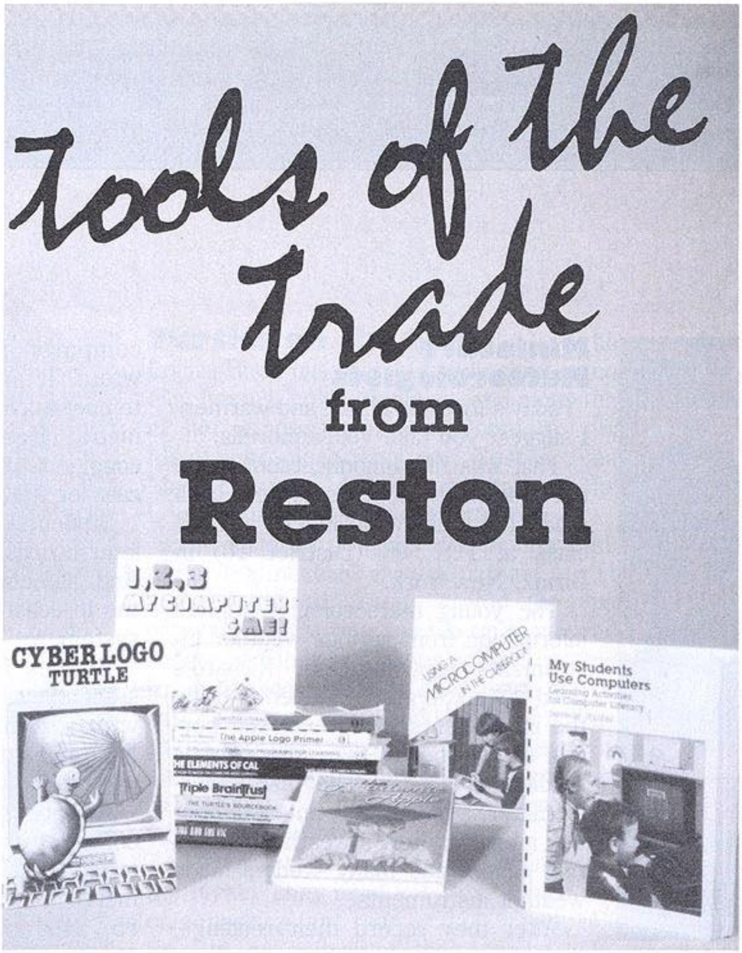
Reston Publishing, 11480 Sunset Hills Rd., Reston, VA 22090.

Scholastic Inc., 730 Broadway, New York, NY 10003.

Simon and Schuster, Inc., 1230 Avenue of the Americas, New York, NY 10020. ■

Judy Simmons is a librarian at the Robert E. Lee Elementary School in Denton, TX.

Tools of the trade from Reston



My Students Use Computers.
An excellent guide that provides a scope and sequence of objectives and activities for integrating computers into the K-8 curricula. R4805-9, cloth, $23.95.

1,2,3 My Computer and Me.
By joining in the escapades of the rabbit and turtle, children discover and learn all about Logo. R5228-3, paper, $10.95.

Triple Brain Trust.
An excellent game for improving basic reading and question-answering skills with topics like General Sports and Movie Trivia. R8790-9, book/disk, $34.95.

Turtle Sourcebook.
A comprehensive guide and workbook for adults working with children learning Turtle graphics. R7890-8, paper, $21.95.

Using Microcomputers in the Classroom.
An excellent introduction to the personal computer, with the emphasis on applications of micros in schools. R8144-9, paper, $12.95.

Creating Computer Programs for Learning.
This guide shows you how to use BASIC to create instructional programs. R1168-5, paper, $14.95.

A complete line of high quality books and software for computers and their use in education. Reston's tools for the trade are perfect for you and your students. There are books for the Apple, the ATARI, the VIC, BASIC, Logo—just to name a few. Reston—the best source for your computer education needs.

CyberLOGO Turtle
is an easy way to learn version of Logo. One of the best ways to learn and explore about computers. R1203-0, box/disk, $79.95.

Elements of CAL.
It covers the basic concepts necessary to understand how good computer aided learning is created, plus new and innovative ideas to experienced practitioners. R1700-5, paper, $16.95.

Kids and the VIC.
An entertaining, step-by-step approach to BASIC programming on the Commodore VIC computer for beginners. R3671-6, paper, $19.95.

Academic Apple.
Written for parents and teachers who are interested in helping youngsters learn with the aid of an Apple computer. R0033-2, paper, $10.95.

Apple Logo Primer.
This handbook makes learning Logo with an Apple II easy for anyone—no previous experience needed! R0314-6, paper, $14.95.

BASICally Speaking.
A beginner's guide to BASIC programming and the story of the microcomputer. R1168-5, paper, $14.95.

Computer Literacy: Programming, Problem Solving, Projects.
Encourages a hands-on exploration of the computer with a unique approach to BASIC programming. R0860-8, paper, $15.95.

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CLASSROOM HAPPENINGS

By Lesli Rotenberg

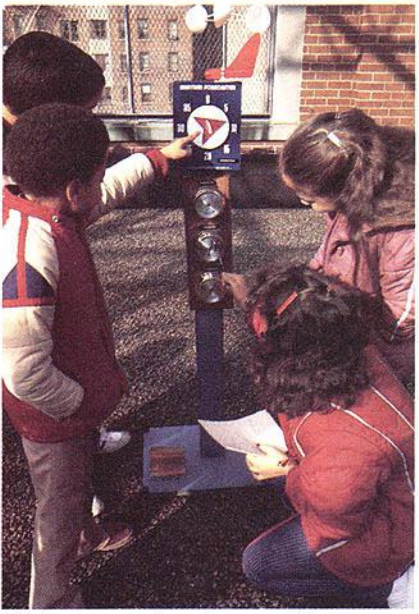


Photo by Elizabeth Glasgow.

Students record weather conditions.

Miniature Meteorologists

"Today's forecast is rain and warmer. I suggest you take your umbrella."

That was the announcement made over the public address system by a student in Richard Bollinger's science class at P.S. 85 (District 10) in Bronx, New York.

The young meteorologist got his information from various weather instruments kept in class. Richard's third to sixth grade students bring the instruments to an enclosed portion of the roof to take atmospheric readings every day. They use a thermometer, a barometer, an anemometer, a hygrometer, a weather vane, a rain gauge, and many student-made weather instruments.

After they record their readings, they enter the information into a computer program that Richard wrote. It prints out the date, time, temperature, relative humidity, barometric pressure, wind speed, sky condition, precipitation, and a forecast for the following 12–24 hours.

Students post the printouts on bulletin boards throughout the school. And sometimes a student delivers the forecast over the public address system.

Besides forecasting the weather, students in fifth and sixth grades write original programs to convert Fahrenheit to Celsius and to determine the windchill factor.

Richard says any teacher with a computer and some weather instruments can use his program. For more information, write him at P.S. 85, 2400 Marion Ave., Bronx, NY 10458. ☐

A Micro Meal

Most students abandon their computers when the lunch bell rings. But students at Ortonville Elementary School in western Minnesota, use a computer to buy their lunch. Their school lunchroom is automated by a microcomputer.

The program they use was written by computer project director Curt Johnson. It works on an Apple computer attached to a bar code wand.

Curt uses a laminating machine to produce a card for each student containing his or her name, identification number, and a bar code. Classroom teachers keep the cards and pass them out at lunchtime.

When a student passes through the cafeteria line, a cafeteria employee scans the card with a bar code wand. A laminated bar code menu is also scanned to record the foods selected.

The computer provides an account of who ate, what was eaten, and revenues for each school day. At the end of each month, parents are billed for the lunches their children consumed.

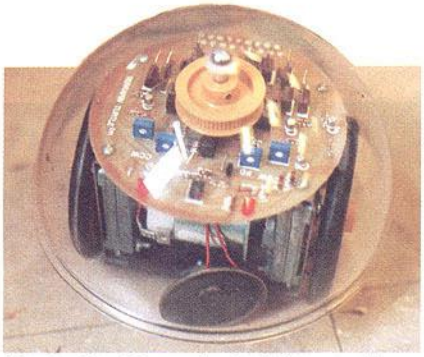
The automated cafeteria serves about 20 children per minute. That's twice as fast as a manual system where lunch money is collected during the line. And it's more effective than a meal ticket system where students typically lose tickets or mangle them in the washing machine.

Several parents have taken advantage of the system's ability to monitor their children's eating habits. "A few parents were surprised that their kids go through the lunch line twice on days when barbecue hamburgers are served," Curt said.

If you want to automate your school cafeteria, contact Curt at Ortonville Elementary School, P.O. Box 247, Ortonville, MN 56278. ☐

Photo by Curt Johnson

A computer manages the cafeteria at Ortonville School in Minnesota.



Meadowbrook's mechanical Logo turtle.

The turtle travels under a tunnel.

Turtles on the Farm

Louisa Birch has sheep, ducks, chickens, horses, cows, donkeys, and pigs in her kindergarten classroom at Meadowbrook School in Weston, Massachusetts. But the mechanical Logo turtle is the center of attention.

The children program a computer to move a mechanical turtle around a model barnyard. They created the barnyard by drawing animals on large sheets of paper and pasting them on large cardboard boxes. They made a barn, a chicken coop, and shelters for sheep and pigs the same way. They also made a tunnel out of cardboard to make the turtle's journey more interesting.

Students take turns programming the turtle. They must keep the turtle on a masking tape road as they travel to visit an animal of their choice. When the turtle reaches an animal, the students can make it sound its horn or wink by pressing a key on the computer keyboard. Sometimes the children imitate the sounds the animals make. They also talk about how each animal contributes to life on the farm.

When the farm unit is over, the students take their animals home. Then they build another Logo environment. So far, their turtle has visited a forest, a town, a pond, and Winnie the Pooh and his friends.

The mechanical turtle this class uses is no longer sold. But there are other programmable toys that do the trick just as well. The Turtle Tot is a mechanical turtle that costs $299.00. Contact: Harvard Associates, 260 Beacon St., Somerville, MA 02134; 617/492-0660. Another possibility is Big Trak, a programmable toy tank. It costs $39–$45. Contact: Milton Bradley Co., P.O. Box 3400, Springfield, MA 01101; 413/525-6411. □

Young at Heart

At Jordan Middle School in Palo Alto, California, seventh and eighth grade students teach senior citizens how to program a computer.

Last year, about 20 senior citizens from the Menlo Park Senior Citizen Center were trained by kids from Jordan School. Some attended evening workshops given by the students. Others arranged appointments for private tutoring during school hours.

Teachers at Jordan School believe that tutoring others helps children learn better programming skills, so every student is required to teach at least two people to program.

As a result of the computer tutor program, the Menlo Park Senior Citizen Center now has its own computer center. Several of the senior citizens returned to Jordan School this year to help students learn about computers. "They become very attached to the students," says Joan Targ, computer program director. □

Artists in Residence

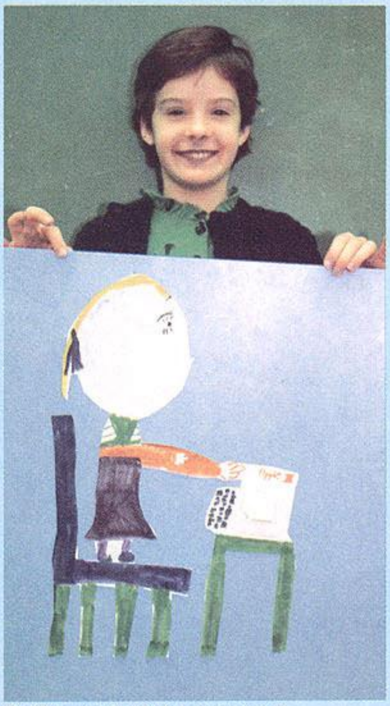
"Look, Grandma. That's me. The one with curly red hair," boasted a second grade student at St. Anne's-Belfield School in Charlottesville, VA.

She was pointing to a life-size drawing of herself working at the computer. It was Grandparent's Day at school. The special day had inspired second grade teacher Ann Holden and art teacher Linda Halliday to decorate the computer room.

Armed with butcher paper, multicolored magic markers, scissors, and 14 second grade students, they set out to decorate the bare walls.

The students worked enthusiastically. When they finished, they cut out the drawings and mounted them on the walls, doors, and filing cabinets in the computer room.

According to programming instructor Brenda Lloyd, the children enjoyed seeing themselves in a new role—as computer users. ■



Self-portrait at the computer.

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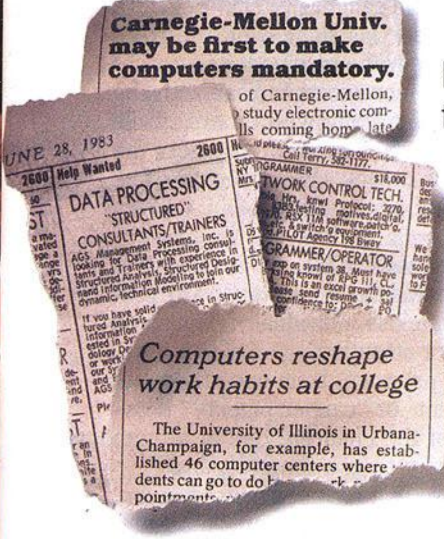

Carnegie-Mellon Univ. may be first to make computers mandatory.

DATA PROCESSING

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Computers reshape work habits at college

The University of Illinois in Urbana-Champaign, for example, has established 46 computer centers where

For Home and School—We've just released numerous educational software programs into the public domain. These programs, written by educators, include courses in Business, Computer Science, English, French, Geography, History, Mathematics. The list goes on and on.

We're also working with major educational publishers to develop new software. For example, a significant portion of the well-regarded MECC courseware has been completely adapted for the Commodore 64. The Edufun™ series from Milliken will be available for home and school use in the near future, and over thirty early learning programs from Midwest Software will help children master the basics.

In addition, we've developed a complete set of software tools to make our educational computers even more useful. Take Logo and PILOT, for example. These popular languages have been completely adapted for the Commodore 64.

Our Educational Resource Centers, 250 strong, continue to provide teacher support in computer use in the classroom, and the number is growing!

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My Computer Teacher Wears Sneakers

By Lesli Rotenberg

Children can make great computer tutors! Here are five ways teachers use peer instruction successfully.

"Are they coming?" Josie asks impatiently. Five-year-old Josie has been waiting for this moment all week.

Suddenly the door swings open and 12 teachers strut into the computer lab, each one donning a different model of Adidas, Nike, or Converse shoes.

Teachers wearing sneakers? The kindergarten pupils don't seem a bit perplexed. These are their fourth grade computer tutors.

Mindy and Jane, two fourth grade students, scurry over to Josie. Mindy scoops up little Josie, sits down, and carefully places the child on her lap. Jane sits beside them and initiates the lesson.

"Do you remember how to write your name on the computer, Josie?" Jane asks in a syrupy sweet voice.

Josie struggles to tap the correct keys, but her little fingers slip on the "s" and press the "x" instead.

"Woops," says Mindy. "Why don't we try again, Joxie—I mean, Josie." She starts to giggle, and the others chime in.

The fourth grade girls are teaching Josie how to operate a computer. When children as young as Josie work on the computer, they need constant feedback. That's why Josie's classroom teacher has devised a system in which each of her students gets not only one, but two personal tutors to teach them about computers.

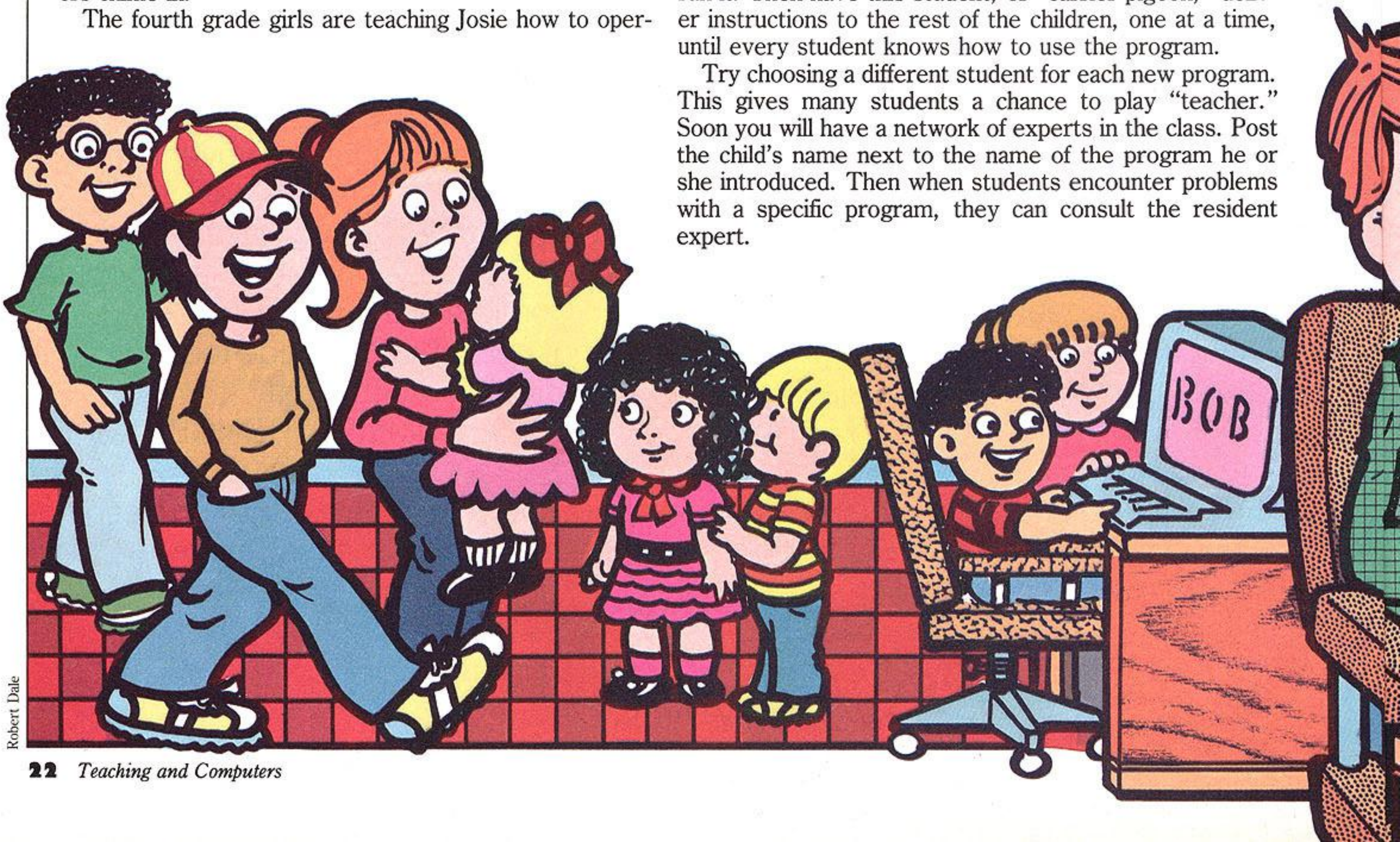
Josie's teacher is not alone. Teachers everywhere are discovering the benefits of peer instruction on the computer. The benefits are for everyone involved. The teacher gains time. The tutor becomes more familiar with the computer and learns how to get along with others, while getting a boost of self-confidence. And the tutee gets the personal attention he or she needs. Following are five teacher-developed methods of peer tutoring.

1. THE CARRIER PIGEON METHOD

You don't have time to introduce a new software program to every student in the class individually. Yet some programs require this kind of attention.

Each time you buy such a program, train one student to run it. Then have this student, or "carrier pigeon," deliver instructions to the rest of the children, one at a time, until every student knows how to use the program.

Try choosing a different student for each new program. This gives many students a chance to play "teacher." Soon you will have a network of experts in the class. Post the child's name next to the name of the program he or she introduced. Then when students encounter problems with a specific program, they can consult the resident expert.



Robert Dale

2. THE EACH-ONE-TEACH-ONE STRATEGY

Rather than have one student teach everyone in the class, teachers at Ellis Elementary School in Sunnyvale, California, turn all the students into instructors. When a new program is introduced, the teacher trains one student to operate it. That student trains another student who, in turn, trains another. If students have questions, they return to the student who taught them for help. The exercise continues until every student has been both a pupil and a "teacher."

"The students love playing teacher," says fourth grade teacher George Jacobs. Sixth grade teacher Mary Ann Semas says, "The students pay more attention when they learn this way, because they have to teach what they learn to the next child."

3. THE TUTOR-A-TOT PROGRAM

Every Monday and Wednesday, the kindergarten class and the fourth grade class meet together in the computer room at Evans School in Yeadon, Pennsylvania. The fourth grade students teach the younger children how to use the computer. They learn the parts of the computer, proper finger placement, letter and number recognition skills, and how to design simple shapes.

The fourth graders like sharing their computer time with the kindergarten students. In fact, they beg the teacher to invite the younger students again. "Teaching the kindergarten kids makes them feel important," says fourth grade teacher Doreen Carson.

"The kids really get attached to each other," says Doreen. To show their appreciation to their tutors, the kindergarten students drew pictures of the computers they used and of their fourth grade teachers. They presented the pictures to their computer pals along with thank-you notes.

4. THE TUTOR TROOP

Teachers at Shallowford Elementary School in Atlanta, Georgia, bring in the troops when they have students who need to be tutored. The "troops" consist of sixth and seventh grade students who are recommended by their teachers. "We find that older students who are struggling with basic skills make great tutors," says lead teacher Ruth Murphy. Tutoring gives them a review and helps build confidence.

Ruth coordinates the tutors' schedules with the schedules of the students who need instruction. The younger student's teacher chooses the software and gives the tutor instructions for how to use it.

Everyone is happy with the tutor troop. "The younger children think the older students walk on water," Ruth says. And the tutors really get involved in teaching. They bring treats from home to reward their pupils when they do good work.

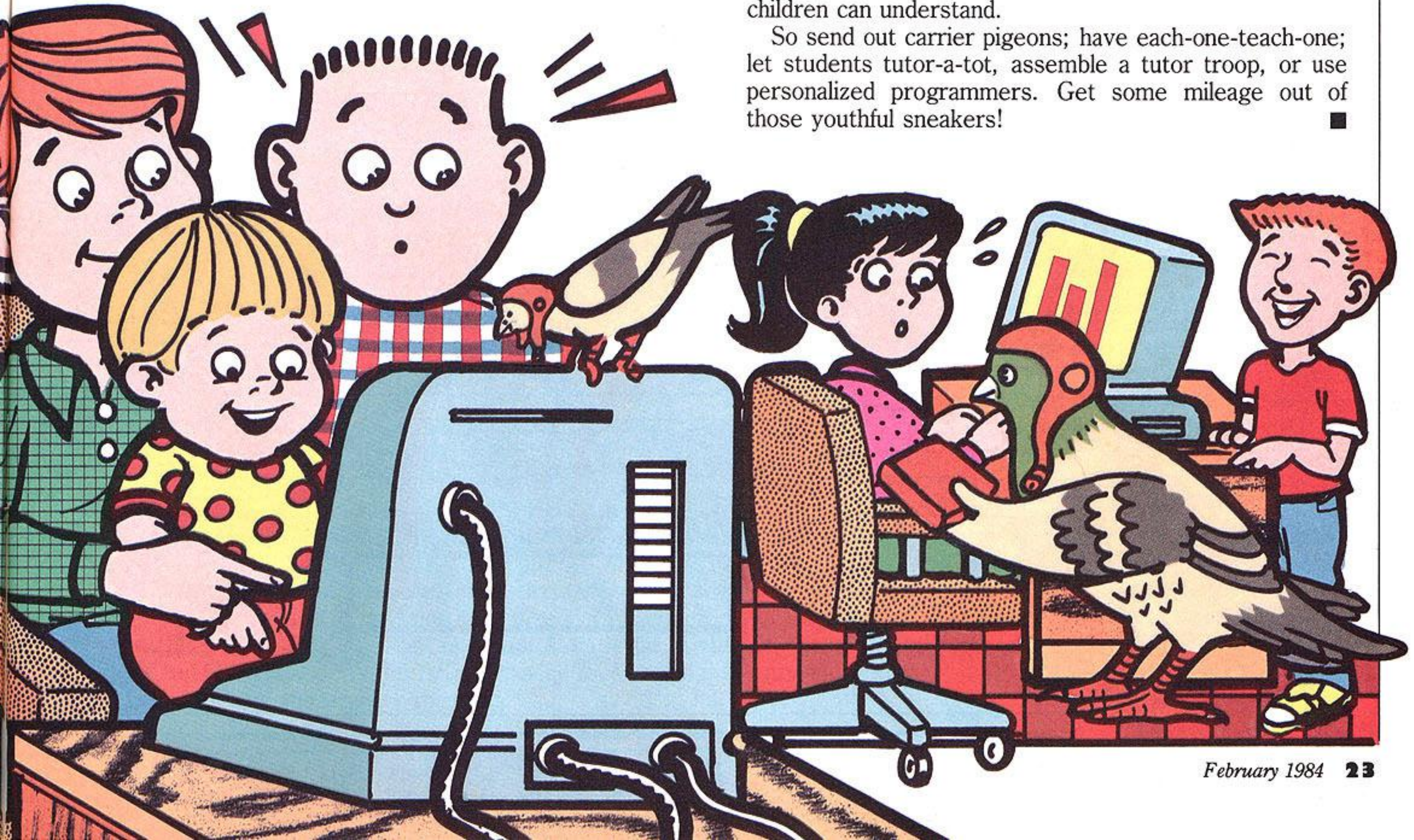
5. PERSONALIZED PROGRAMMERS

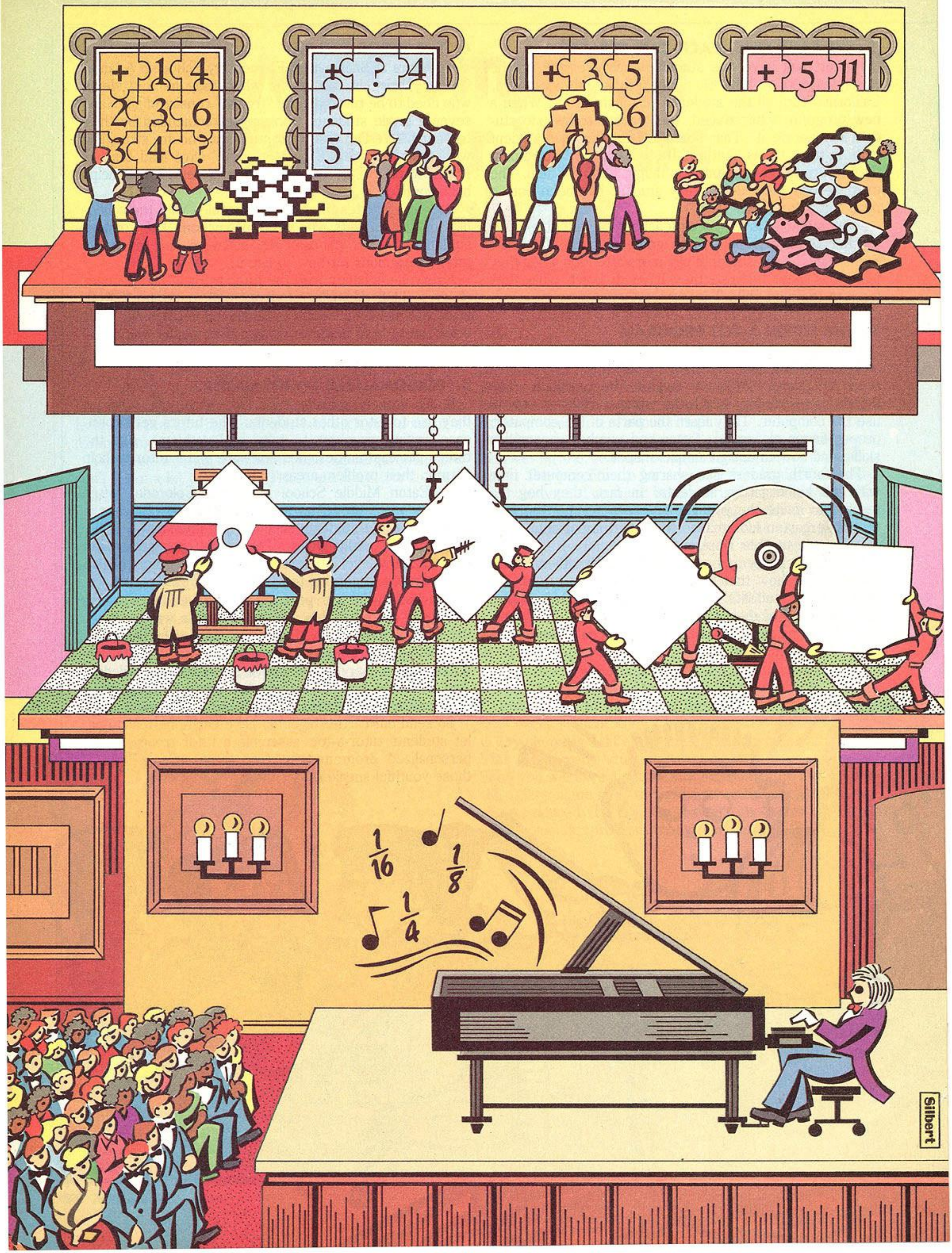
Some schools actually have kids write the software they use to tutor other students. The tutors get experience writing programs to solve real problems. And the tutees get custom-designed software and a tutor to help them in their problem areas.

At Eaton Middle School in Eaton, Colorado, gifted students write programs that drill remedial students in math. Then the students sit down together and test the programs. It really works. During the program's first year, 32 low-level students gained an average of 1.8 years overall, according to a Title 1 teacher's report.

Teachers who use peer tutoring have discovered a wonderful resource. It's a resource that's walking down the halls of your school this very minute. Clad in sneakers, blue jeans, and sweatshirts, these young, enthusiastic computer users are eager to share their knowledge. And often they know how to explain things in words other children can understand.

So send out carrier pigeons; have each-one-teach-one; let students tutor-a-tot, assemble a tutor troop, or use personalized programmers. Get some mileage out of those youthful sneakers! ■

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MISSION: MIND·STRETCH

Develop math problem-solving skills with these three software programs.

By Susan N. Friel

Your mission, should you decide to accept it, is to find stimulating software that teaches problem solving. You search high and low, but all math software seems to be drill and practice. Did you ever try looking outside the traditional math zones?

Here are three out-of-the-ordinary programs that will solve your problems, so to speak. The first one challenges students to complete puzzles. The second asks them to manufacture a new product. And the third, to compose music. To perform each of these tasks, students will need to explore uncharted math horizons and, in the process, will do a little mind stretching.

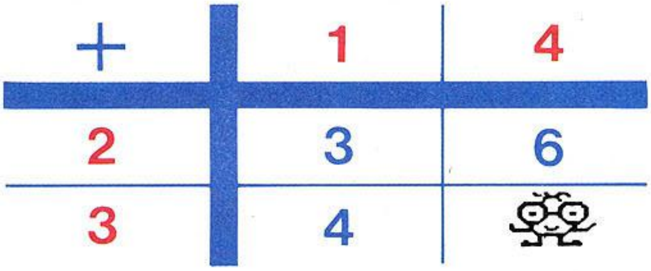
Teasers By Tobbs: Puzzles and Problem Solving

Computers: TRS-80 Model I, III, 4; Atari; Apple

Tobbs is a short, funny looking character with bug eyes who jumps around addition and multiplication grids, landing on missing number locations. At each location, your students enter the missing number.

"Betsy, tell Tobbs what to put in the box," the friendly program instructs. If the student (in this case Betsy) enters the correct number, Tobbs jumps up and down or turns in circles. If the answer is incorrect, the character shakes its head. At any time, students can ask for help if they are "stumped" on how to proceed.

The diagram below shows a *Tobbs* addition puzzle.



+	1	4
2	3	6
3	4	

This is a lower level Tobbs *puzzle. Students must add two red numbers to get a blue number. To find the answer to this puzzle, the student adds three and four to get seven.*

There are six levels of difficulty for each operation. The lower levels ask students to perform straightforward computations and to report an answer. In the higher levels, children are asked to work backward to solve problems like 1 + ? = 3. Level six is more open-ended; there are multiple solutions for each puzzle. At this level, students must think about answers that "must be," that "could be," or that "could not be" correct. For example, in the following puzzle, the value for A must be 9; the value for B could be 7, but then the value for C could not be 13 (or any value larger than 13).

+	?	4
?	B	?
5	C	A

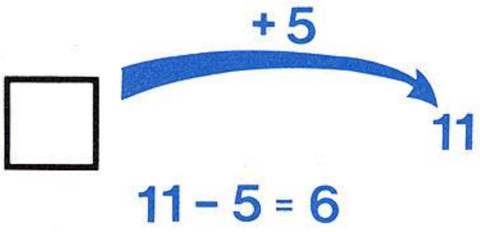
This puzzle grid from Teasers by Tobbs *poses multiple solutions.*

Before you introduce your students to Tobbs, you should review how an addition or multiplication grid works. It's OK to let your students use a pencil and paper to solve the puzzles. But solving the puzzles without pencil and paper is ideal, because it will help children develop mental arithmetic skills.

Following are some problems that will prepare students for Tobbs' puzzles as well as problems they can use along with the program.

Mind-Stretcher #1: Undo To Do

Here's an activity to help students with inverse operations. Draw a box on the board. Then draw an arrow from the box to a whole number such as 11. Above the arrow, write "+ 5." Students must determine what belongs in the box. To do so, they must "undo" the action of "+ 5" that resulted in 11. Undoing this action means subtracting five from 11 to get six. Look at the diagram that follows. Now try it with multiplication instead of addition. Let students choose their own numbers and challenge each other to determine what belongs in the box.



This problem helps students with inverse operations.

Mind-Stretcher #2: Make Your Own Puzzles

After your students are familiar with the program, let them create their own puzzles. They will need to discuss the best way to do this. Here's one way: create a completed puzzle grid by identifying all outside numbers (red) and computing all inside numbers (blue). Then determine which numbers to "block out." Decide if there will be only one solution or multiple solutions to the puzzle.

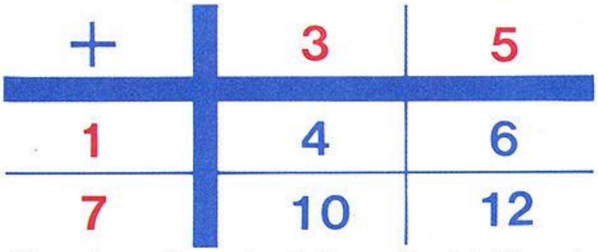
Have groups of students challenge each other by trading puzzles. Or display puzzles on a bulletin board for all students to try.

(continued)

(continued from page 25)

Mind-Stretcher #3: More Puzzle Challenges

Have students create larger grids, such as grids with four numbers down and four numbers across. Challenge them to make grids in which all inside numbers are odd, or grids in which all inside numbers are even. What must be true about outside numbers in each of these puzzles? (If all of the outside numbers in a puzzle are odd, then all of the inside numbers must be even. See the diagram.)



+	3	5
1	4	6
7	10	12

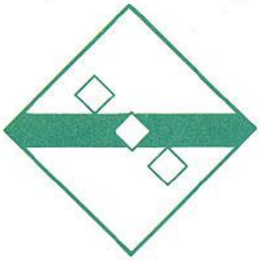
In this puzzle, outside numbers (red) are odd and inside numbers (blue) are even.

When students get really advanced, have them create puzzles that use numbers larger than 99, or puzzles that use decimals or fractions.

The Factory: Strategies for Problem Solving

Computers: TRS-80 Color Computer; Commodore 64; Atari; Apple

In a program called *The Factory*, students become factory workers. As factory workers, they make "products" using machines that punch, rotate, and place stripes on squares. The punch machine can punch one, two, or three small circles or squares at one time; the rotate machine rotates squares 45, 90, 135, or 180 degrees; and the stripe machine places thin, medium, or thick stripes on squares. A sample finished product is shown on this page. Have kids imagine what their products could be used for.



In The Factory, *students create their own products. This product was punched with three squares, then rotated 135 degrees, and painted with a thick stripe.*

There are three parts of the program. The first part, "Test a Machine," lets students try each machine to see the effect it has on the raw material. In the second part, "Build a Factory," students can set up an assembly line using the different machines and watch a product as it is produced. "Make a Product," the third and most challenging part, presents students with a product made by several machines. Students are asked to reconstruct the sequence of machines and processes used for its creation.

The Factory teaches students to solve problems by working backward, analyzing a process, determining a sequence, and applying creativity.

Following are some activities to try in class with *The Factory*.

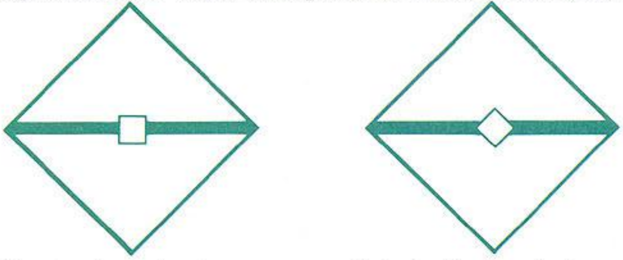
Mind-Stretcher #1: Classroom Factory

When it comes to showing kids how the punch, rotate, and stripe machines actually work, *The Factory* is not very explicit. As you introduce the program to your class, give children the following equipment: white squares of construction paper, hole punches, paint, paint brushes, and some type of rotating platform, like a lazy Susan or a potter's wheel. Tell them to use these tools to visualize how the machines in *The Factory* work. For example, to show how the rotate machine works, children can place a square piece of construction paper on a lazy Susan or a potter's wheel and practice turning or "rotating" the square 45, 90, 135, and 180 degrees.

Mind-Stretcher #2: Product Analysis

Challenge students to determine if using the same machines in a different order produces identical products. For example, if you first punch and then stripe, will you get the same result as when you first stripe and then punch? (Yes.)

Now ask if the number of degrees you rotate matters. For example, rotating 45 degrees, punching one square hole, and then laying a thin stripe produces the product on the left below. But punching one square hole first, then rotating 45 degrees, and laying a thin stripe produces the product on the right below. What happens if you rotate 90 degrees in each case? (The products will look identical.)



These products show how sequence affects the final product.

Mind-Stretcher #3: Smart Shoppers

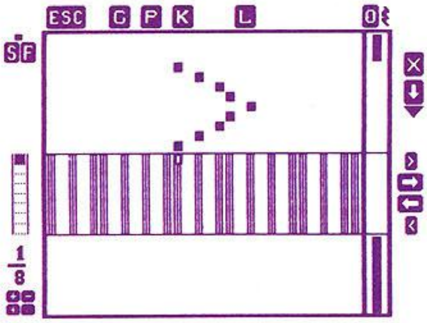
Tell your students that there is a specific cost each time they operate a machine in the factory. For example, each time they use the punch machine, they must add two cents to the cost of the final product. Each time they use the rotate machine, they must add three cents. And each time they use the stripe machine (because of the paint involved), they must add four cents. Now ask students to find sets of products that cost the same to make. Have them find the most expensive product and the least expensive product. Challenge them to determine an average cost for products made with two machines, three machines, and so on.

Songwriter

Computers: Commodore 64; IBM PC; Atari; Apple

How is writing songs related to math? Any musician will tell you that musical notes are really mathematical fractions—units of time chopped into quarters, halves, eighths, and so on. *Songwriter* teaches students how to create music. And in the process, it teaches them problem-solving skills and the mathematics of fractions.

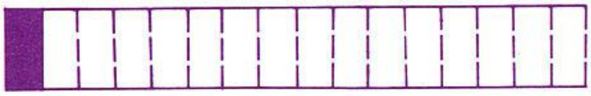
In *Songwriter*, a piano keyboard appears on the screen. By pressing arrow keys, you can move the cursor to different notes on the keyboard. Pressing the RETURN key plays the notes. And pressing the space bar records the notes so you can play them back. Above the keyboard, the notes you play are marked by little boxes that scroll up the screen. (See diagram on this page.)



The boxes above the keyboard in this illustration from Songwriter *show that nine notes have been played.*

Pressing number keys changes the length of time a note is played, from, say, one-fourth of a measure to one-eighth of a measure. *Songwriter* shows you how long a note is by shading in a fraction bar that appears on the lower left side of the screen. For example, the entire bar would be shaded for a whole note.

By dividing, you can get a note that is shorter than the one currently on the fraction bar. Let's say the fraction bar is divided into eight parts. If you divide by two, each part of the fraction bar will be divided into two pieces. Now you have a fraction bar with sixteen parts. If you press the number key "1," you will have a note length of one-sixteenth; a sixteenth note. (See illustration.)



This fraction bar is set to one-sixteenth.

On the other hand, you can get longer notes by multiplying. If you multiply by two, each part of the fraction bar will get twice as big and your note will get twice as long. Once you do this, you will return to a fraction bar with eight parts.

You can also change the top number of a fraction. You do this by adding or subtracting. For example, adding three to a fraction bar of nine-sixteenths results in twelve-sixteenths.

The possibilities for learning about fractions and problem solving with *Songwriter* are endless. Here are some ideas:

Mind-Stretcher #1: Scrambled Notes

You can divide a fraction bar into one, two, three, four, six, eight, 12, 16, 24, or 48 parts. Challenge students to set the fraction bar to each of these. Ask how they change a fraction bar that shows eight parts into one that shows three parts. (Multiply by eight first. Then divide by three.) When is a note length the same as another note length? (For example, a note length of two-eighths is the same as a note length of four-sixteenths.) What other relationships can your students find?

Mind-Stretcher #2: Let Me Count the Ways

Set the fraction bar to eight parts. How many different ways can your students record three notes so that the note lengths add up to six-eighths? One way is to set the note length to two-eighths and record the note three times. What other ways are possible? Now try to record four notes that add up to six-eighths. (You can do this by setting the note length to two-eighths and recording the note twice, and then setting the note length to one-eighth and recording the note twice.)

Mind-Stretcher #3: Number That Tune

Ask students to create mystery songs that use notes of several different lengths. Play with a fraction bar with a specific number of parts. For example, set the fraction bar to eight parts and create a song using the eight eighth notes. The challenge is for the other students to listen to the song and identify which fraction bar is being used. To warm up their ears, have students listen to other songs already on the disk. Load the song named "Note Lengths" and let students study the fraction bar as it plays.

I advise you to teach math problem-solving skills with *Teasers by Tobbs, The Factory,* and *Songwriter.* Ten seconds after you try these programs, your belief that all math software is drill and practice will automatically self-destruct. ■

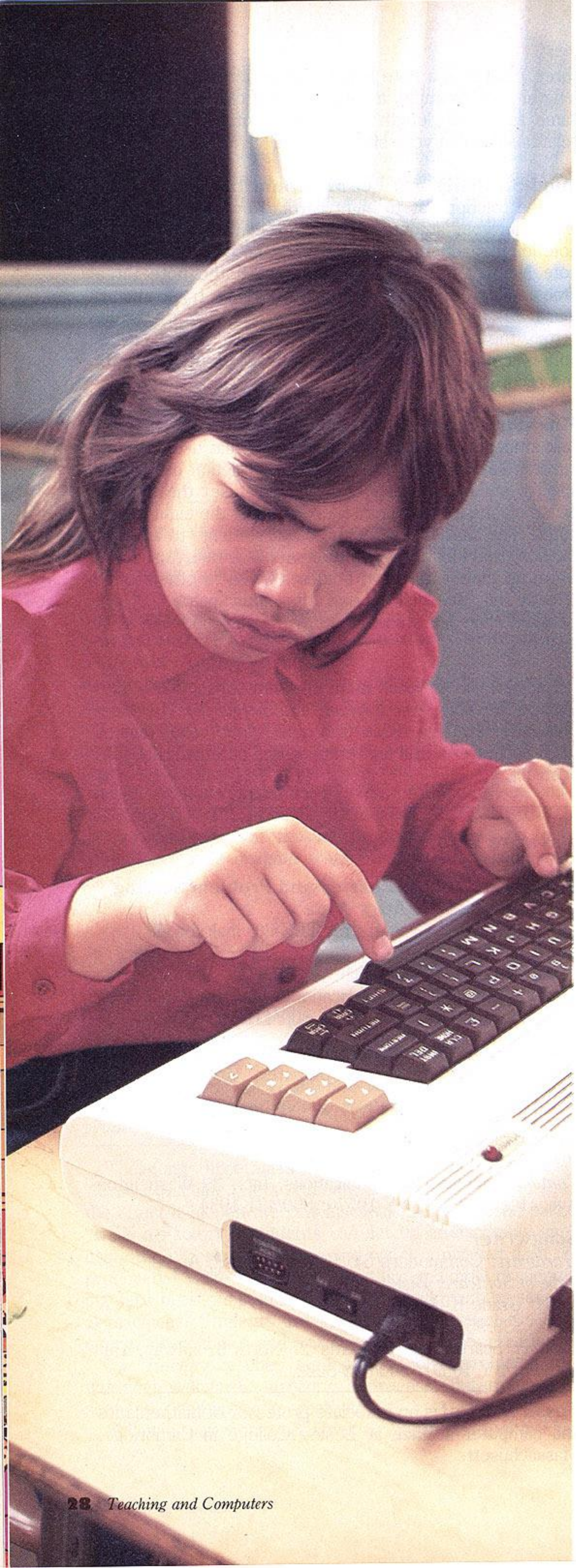
Software Info:

Teasers By Tobbs: Puzzles and Problem Solving
Hardware: TRS-80; Atari; Apple
Type of Software: Cassette for TRS-80; disk for all
Level: Grade 3–Adult
Price: $49 disk; $39 cassette
Contact: Sunburst Communications, Inc., 39 Washington Ave., Pleasantville, NY 10570; 800/431-1934.

The Factory: Strategies in Problem Solving
Hardware: TRS-80 Color Computer; Commodore 64; Atari; Apple
Type of Software: Disk
Level: Grade 4–Adult
Price: $49
Contact: Sunburst Communications, Inc., 39 Washington Ave., Pleasantville, NY 10570; 800/431-1934.

Songwriter
Hardware: Commodore 64; IBM PC; Atari; Apple
Type of Software: Disk
Level: Grade K–Adult
Price: $39.95
Contact: Scarborough Systems, 25 North Broadway, Tarrytown, NY 10591; 800/882-8222.

Susan N. Friel is an associate professor of mathematics and computer science at Lesley College in Cambridge, Massachusetts.


Richard Hutchings

Say Goodbye to Hunt-and-Peck

Now there's an easy way to teach touch typing! Just follow this three-step process.

By Lorraine Hopping

Hunt-and-Peck isn't a comedy team—it's a slow and tedious method of typing that many of your students use when they operate computers. Unfortunately, this method demands a great deal of time and energy that could be spent on more important computer activity.

Children can be taught to move their fingers across the keyboard with ease and relative speed through a process known as touch typing. Although primary grade children do not have the fine motor skills needed to completely master touch typing, they can learn to locate the keys easily by following the basics of this process. Second and third graders can pick up a little speed through the fingering techniques. And with practice, fourth through sixth graders actually can average 25 to 30 words per minute.

The following three-step process will provide you with *key* strategies for teaching touch typing. In the first step, students will locate keys and learn proper fingering on a paper keyboard. Next, they'll practice the proper fingering on typewriters or computers, using exercises written on three-dimensional typing cards, known as typing triangles. Finally, students will pick up typing speed, by playing commercial typing games.

Step One:

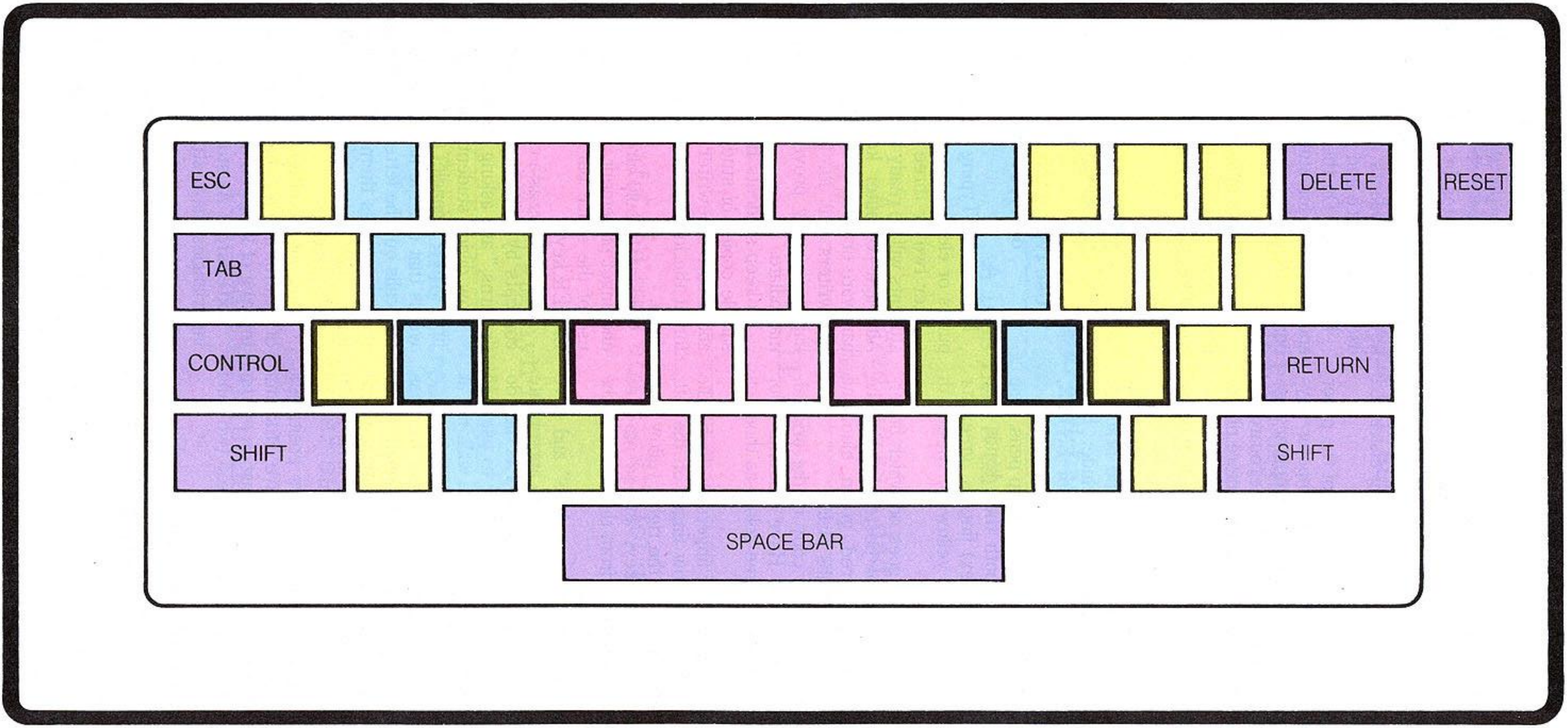
Learn proper fingering on paper keyboards.

Materials: One copy per student of the paper keyboard on page 29; red, green, yellow, blue, purple, and black felt-tip pens; two pieces of poster board; rolls of

(continued on page 30)

Computer Keyboard

NAME ____________________


ESC
DELETE
RESET
TAB
CONTROL
RETURN
SHIFT
SHIFT
SPACE BAR

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CUT OUT AND REPRODUCE

(continued from page 28)

red, green, yellow, and blue tape (optional).

Activity: A good way to introduce children to the computer keyboard is through paper replicas. This way every child gets his or her own keyboard, and kids will be able to concentrate on fingering without being distracted by the "feel" of the keys.

Begin by giving each student a photocopy of the paper keyboard that is on the previous page. (Computer keyboards vary from model to model. If the computer keyboards in your school differ from this paper keyboard, be sure to pencil in the necessary adjustments before photocopying.)

Ask children to locate the computer's special function keys on their paper keyboards. Call out the names of these keys, one at a time, and tell students to color the keys purple. Special keys differ from machine brand to machine brand, but they probably will include: ESC, CONTROL, DELETE, RESET, RETURN or ENTER, SPACE BAR, and TAB.

Using small pieces of colored tape or felt-tip pens, help students cover the fingernails of both their hands with these colors: red for the first (index) fingers, green for the second, blue for the third, and yellow for the fourth fingernails.

To remind students which color goes on which fingernail, make a pair of hands out of poster board. The fingernails of each hand should be red, green, blue, and yellow, consecutively. (Leave thumbs plain.)

Post the hands and an enlarged copy of the original, colored paper keyboard on a wall. Have students color the keys on their keyboards the same colors as those on the display keyboard.

Show students how to place their fingers on the middle row of keys (*home row*): left, yellow finger on the left, yellow key; right, yellow finger on the right, yellow key; left, green finger on left, green key, and so on. Red fingers go on the red keys farthest from the center of the row (where "J" and "F" would be).

Call out commands like "right hand, blue" and have students practice "pressing" the key with the appropriate finger. (Make sure kids don't peek at the keys as they do this drill.) If they forget which key or finger to use, tell students to look at the paper keyboard on the wall, not at their own keyboards.

Show students how to use their first fingers to press the two center keys on the home row. Designate these keys "left, red two" and "right, red two." Continue to call out key locations at a steady rhythmn for five to 10 minutes.

The next day, introduce the row of keys positioned directly above home row. Once again, have students match up fingernail colors with key colors. Just as on the home row, the keys in the center are "left, red two" and "right, red two."

For five to 10 minutes, call out different combinations of keys, such as "home row, green; top row, blue," and so on. Students must "press" the correct left- and right-hand keys without looking.

Repeat this exercise with the bottom row and the very top row in subsequent lessons.

After a week or so, introduce the letters of the keyboard, one at a time, starting with the home row. For each key, have students fill in the letter using a black felt-tip pen. After each row of keys is labeled, drill students for a few minutes by calling out letters for students to press.

When all the colors and letters are filled in, laminate the keyboards. Students now have a personal keyboard to use for reference and practice.

Extension: On the chalkboard, write letters, words, and sentences for students to type on their paper keyboards. Remind students not to peek at the keys as they type.

Have students make up lists of words that use only the home row, only the top letter row, or only the bottom row of keys. Display these words for students to practice typing.

Step Two:

Use typing triangles for drill and practice on typewriters and computers.

Materials: Typing triangles (pages 31 and 33); computers or electric typewriters.

After two or three weeks of using paper keyboards, students will be ready to get the "feel" of a real keyboard. Although computer keyboards are preferable, if either hardware or word processing software is scarce, electric typewriters will do. Manual typewriters, on the other hand, generally prove too difficult for small fingers to manipulate.

To keep students from peeking at the keyboard, post sample copies of students' paper keyboards on the wall above each typewriter or computer. That way, if students forget the location of a key, they can look up instead of down.

Students should already be familiar with key locations and finger placement. All you need to do is introduce the use of the space bar and carriage return (RETURN or ENTER key).

Drill students as a class for five or 10 minutes on these concepts by calling out individual letters, "spaces," and "returns," and asking students to type them.

Now divide students into pairs, and give each pair the first typing triangle (page 31). It contains letters and words that use the home row keys. One student in each pair calls out the letters and words on the triangle, while the other types them. (The caller also checks for peeking.) After approximately 15 minutes, have partners switch places.

Hand out the other three triangles (one for the top row of letters, one for the bottom row, and one for the very top row of keys) on consecutive days.

Extension: As students become proficient on the typing triangles, have students make up their own triangles, using words on a spelling or vocabulary list. They can trade triangles and challenge each other with harder and harder triangles.

Some teachers recommend having students type to music. Popular music that has a steady beat and medium tempo works best.

You may wish to set up weekly typing contests in

(continued on page 32)

Typing Triangles 1 & 2

Typing Triangle #1

1

asdf jkl; asdf jkl; asdf jkl;

as df jk l; as df jk l;

(fold here)

2

fgf jhj fgf jhj fgf jhj

sad dad fad gad had lad

(fold here)

3

A lass has a dad

Al has a glad lad as a dad

(fold here)

PASTE HERE

Typing Triangle #2

1

frf dad sws aqa juj kik lol ;p;

ftf jyj gtg hyh ftf jyj gtg hyh

(fold here)

2

Derek has a treat at the house

Lulu gets a dollar as a gift

(fold here)

3

You had a good plaid dress

It is always as good as gold

(fold here)

PASTE HERE

Directions: To make a typing triangle, cut out pattern and fold paper on dotted lines, with type facing out. Paste edges together. You'll have a three-dimensional triangle. Permission granted to reproduce this worksheet for classroom use. Copyright © 1984 by Scholastic Inc.

(continued from page 30)

which students type all the letters on a triangle as fast as they can. Each week, post the winning results—those papers completed in the least amount of time, with the fewest mistakes—on a bulletin board labeled "Typing Aces."

Step Three:

Use commercial software to improve students' typing speeds.

Materials: Commercial typing software; computer.

Activity: After drilling on the typing triangles for a few weeks, finger placement should be second nature to students. Now they are ready to work on typing speed. Commercial typing programs are excellent tools for this.

There are generally two kinds of typing programs: (1) tutorial and (2) drill and practice. Both types encourage quick and accurate typing.

Even though tutorial programs are supposed to provide basic instruction, most require teacher supervision if students have not been previously introduced to finger placement. Any student who has completed steps one and two of this typing program probably can work independently on them, however.

Of the drill and practice programs, many are arcade-type games. For example, in programs like *Type Attack* and *MasterType,* students must type letters quickly to avoid being bombarded. The faster they type the letters, the better their score.

Some teachers find that when using these game programs, many students become involved in winning the game and revert to hunt-and-peck to type faster. To make sure students do the drills properly, some teachers require that students be more proficient at touch typing than at hunting-and-pecking before using the software. They do this by requiring students to type 15 to 20 words per minute before allowing them to play the games. Such speed goals also provide an incentive for students to practice harder on the typing triangles.

Many teachers recommend using a combination of tutorial and drill and practice programs for typing practice. Tutorials reinforce good instruction, while the drill and practice games boost enthusiasm for typing.

MasterType

Description: This is one of the most popular typing games. Students fend off enemy words by typing them in. Seventeen lessons cover letters, words, and punctuation marks. Teachers create the eighteenth lesson themselves.

Hardware: Apple II Plus, IIe (48K); Atari 400, 800, 1200 (cartridge and disk); Commodore 64 (cartridge and disk); IBM PC.

Price: $39.95; IBM version is $49.95.

Contact: Scarborough Systems, 25 North Broadway, Tarrytown, NY 10591.

Microcomputer Keyboarding (four disks)
Alphabetic Keyboarding (two disks)

Description: Designed as a comprehensive typing package for all skill levels, *Microcomputer Keyboarding* contains a thirty-lesson tutorial and drill and practice program on four disks. It can check for speed, accuracy, or both. *Alphabetic Keyboarding* (two disks) provides an introduction to the letters, numbers, and symbols on the keyboard.

Hardware: Apple II Plus, IIe (32K) and Apple Corvus Network; TRS-80 Models III and 4 (48K) and TRS-80 Network III; IBM PC (64K).

Price: *Microcomputer Keyboarding* (four disks) is $200 for single computer versions, $795 for Apple Corvus Network, and $750 for Network III; *Alphabetic Keyboarding* (two disks) is $89.50 for single computer versions.

Contact: South-Western Publishing, 5101 Madison Rd., Cincinnati, OH 45227.

Microtyping II

Description: Provides tutorial as well as drill and practice exercises. Students type sentences and save them on disks. The program records speed and errors. For elementary students and above.

Hardware: Apple II Plus, IIe (48K); Atari 400, 800 (48K).

Price: $29.95.

Contact: Hayden Software Co., 600 Suffolk St., Lowell, MA 01853.

Type Attack

Description: In this drill and practice program, letters and words descend in "attack waves;" students must type the letters or words before they reach the bottom of the screen. Players can control speed. Appropriate for all ages.

Hardware: Apple II, II Plus, IIe (48K); Atari 400, 800, 1200 (48K); Commodore 64; IBM PC; VIC-20 (no additional memory required).

Price: $39.95.

Contact: Sirius Software, 10364 Rockingham Dr., Sacramento, CA 95827.

Typing Tutor

Description: This program provides tutorial as well as drill exercises. Students choose keys they wish to work on. Teachers can monitor up to 49 students. The program measures speed and accuracy, and creates individualized drills to focus on each student's weaknesses. Has only upper case letters.

Hardware: Apple II Plus (48K), IIe (64K).

Price: $24.95.

Contact: Microsoft Consumer Products, 400 108th Ave. NE, Bellevue, WA 98004. ■

Lorraine Hopping is assistant editor for *Teaching and Computers.* Educators who contributed ideas to this article are ***Thomas Boudrot***, coordinator of computer instruction, Alief, Texas; ***Beth Deardorff***, sixth grade teacher, Orono, Maine; ***Meredith Richards***, researcher, Charlottesville, Viriginia; ***Brenda Lloyd*** and ***Janet Posner***, elementary school teachers, Charlottesville, Virginia; ***Mary Ellen Switzer***, typing instructor, Del Mar, California; and ***Bryna Watkins***, typing club instructor, Bedford, New York.

CUT OUT AND REPRODUCE

Typing Triangles 3 & 4

Typing Triangle #3

1

fvf dcd sxs aza jmj k,k l.l ;/;

fvf fbf jmj jnj gbg hnh

(fold here)

2

I can type without looking.

What is new at the zoo with you?

(fold here)

3

The quick brown fox jumped over

the lazy, good for nothing, dog.

(fold here)

PASTE HERE

Typing Triangle #4

1

1234 5678 90 123 234 456 789

12 23 34 45 56 67 78 89 90

(fold here)

2

$10 25¢ 32% #78 (90) 5&10

@91 100%! *54* -20- $89.24 4'3"

(fold here)

3

$39 buys 4 3x5" cards and 10 pens

87% x 26 = $22.62 @ 9% interest

(fold here)

PASTE HERE

Directions: To make a typing triangle, cut out pattern and fold paper on dotted lines, with type facing out. Paste edges together. You'll have a three-dimensional triangle. Permission granted to reproduce this worksheet for classroom use. Copyright © 1984 by Scholastic Inc.

LEARNING CENTER

Of Strings and Variables

By Sandra Markle

This month's column teaches students how computers store and retrieve information through variables.

Each month in Learning Center, computer specialist Sandra Markle gives you a programming lesson in BASIC. She provides you with a group lesson guide and six task cards to cut out, laminate, and use in your computer center.

Setting Up

Here are two new symbols to add to your "Command Post" or computer bulletin board:

$ The dollar sign tells the computer that the information to be stored will be letters or characters.

; The semicolon connects separate tasks handled by a single command.

A Group Lesson

A computer's ability to store and retrieve information quickly makes it a powerful tool. This ability greatly depends on the use of variables—letters that label specific locations (called *addresses*) in a computer's memory. Each address can store a number with unlimited digits, or a single letter or character. When strung together, addresses can store whole words and sentences.

Label the individual cups of an empty egg carton with the letters A through L. Tell students that each cup represents enough space to store a number.

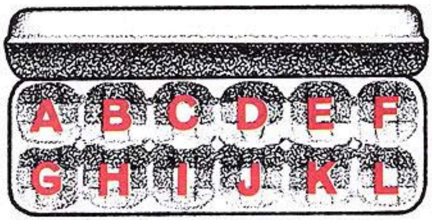
Show the class a piece of paper with the number seven on it. Put the paper in cup A of the egg carton. Close the carton and ask students what number they can retrieve from cup A. *(Seven.)*

Write this short program on the board:

```
NEW
10 A = 7
20 PRINT A
END
```

Have a student type the program into the computer. Ask students what number the computer has stored in location A. RUN the program to show that the computer has stored the number seven.

Explain that the letter A in the program is like the letter A in the egg carton. It's a code name, or a *variable*, that marks the location of stored information. *Initializing a variable* means to assign a value to a variable, such as A = 7.



Egg carton simulates computer storage.

Replace the seven in cup A with a piece of paper numbered five. Ask students what number they can retrieve from cup A now. *(Five.)* Ask students why this is true. *(Because the cup can hold one number at a time and the number five has replaced the number seven.)*

Write this program on the board:

```
NEW
10 A = 5
20 A = 8474
30 PRINT A
40 END
```

Ask students what number the computer will print in this program. *(8474. It replaced five.)* Have a student RUN the program to double-check.

Show students a second egg carton without labels. Cut out six pieces of paper and write the letters H-O-T-D-O-G on them. Put each letter in a cup. Label this set of six cups A$ (pronounced *A-string)*.

Explain that for letters or characters, the computer uses *string variables*. Because each address in the computer's memory can store only one letter at a time, the computer has to string together several addresses to make a word. The addresses are collectively labeled with a single string variable.

Write these programs on the board:

```
NEW
10 X$ = "I LIKE PIZZA."
20 PRINT X$
30 END
```

```
NEW
10 X$ = "I LIKE PIZZA."
20 X$ = "I LIKE ICE CREAM."
30 PRINT X$
40 END
```

Have a student type in each program separately and predict the outcome. RUN the programs to check the results.

Using the Task Cards

Task Card #15: Students use variables to solve problems.

Task Card #16: Students learn that the same variables can perform many tasks. *Answers: 2, S, C, 3, C.*

Task Card #17: Students use variables in a program to solve problems. *Answers: M, 175, M*P, T.*

Task Card #18: Students learn that the computer can process variables in many mathematical operations. *Answers: 10 L = 50, 20 T = 12, 40 P = L * T * I + L, 60 PRINT P.*

Task Card #19: Students discover that semicolons can connect variables in a single PRINT command. *Answer: BECAUSE THEY HAD TO PACK THEIR TRUNKS.* (Editor's Note: Atari users see chart, page 68, for program changes.)

Task Card #20: Students use string variables and semicolons to create simple stories. (Editor's Note: Atari users see chart, page 68, for program changes.) ■

Sandra Markle is the author of several computer books for children.

Clare Sieffert

CUT OUT AND LAMINATE

LEARNING CENTER TASK CARD

15

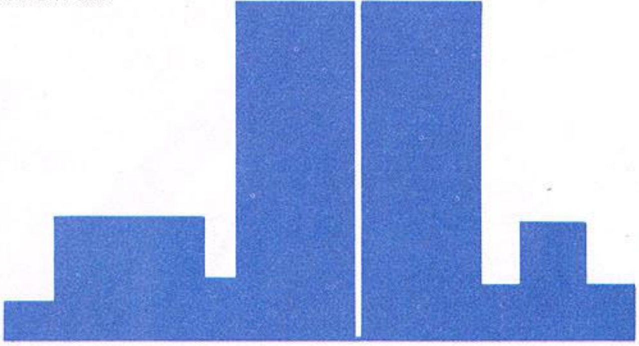
QUICK CHANGE

The twin towers of the World Trade Center are 16,344 inches high. How many feet tall is that? The program below uses variables to quickly change inches to feet.

Variable List
WT = Height of the World Trade Center
I = Number of inches in a foot
F = Feet

```
NEW
10 WT = 16344
20 I = 12
30 F = WT/I
40 PRINT "THE ANSWER IS . . . "
50 PRINT F
60 END
```

Type in the program and RUN it to get your answer.



LEARNING CENTER TASK CARD

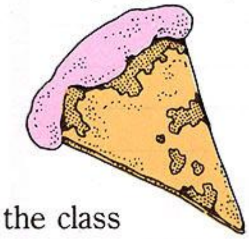
16

PARTY PLANNER

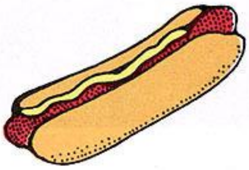
It's party time! Your class voted to have hot dogs, soft drinks, and potato chips. You will need two hot dogs and two soft drinks per person. One bag of chips feeds three people. How many hot dogs, cans of soft drink, and bags of chips will you need to buy for your class? On a sheet of paper, write the program.

Fill in the missing parts of the program and run it to find your answer.

Variable List
HD = Hot dogs
C = Cans of soft drink
PC = Bags of potato chips
S = Number of students in the class



```
NEW
10 S = □
20 HD = 2
30 C = □
40 HD = HD * □
50 C = □ * S
60 PC = S/□
70 PRINT "YOU WILL NEED TO BUY"
80 PRINT HD
90 PRINT "HOT DOGS,"
100 PRINT □
110 PRINT "CANS OF SOFT DRINK,"
120 PRINT PC
130 PRINT "BAGS OF CHIPS."
140 END
```



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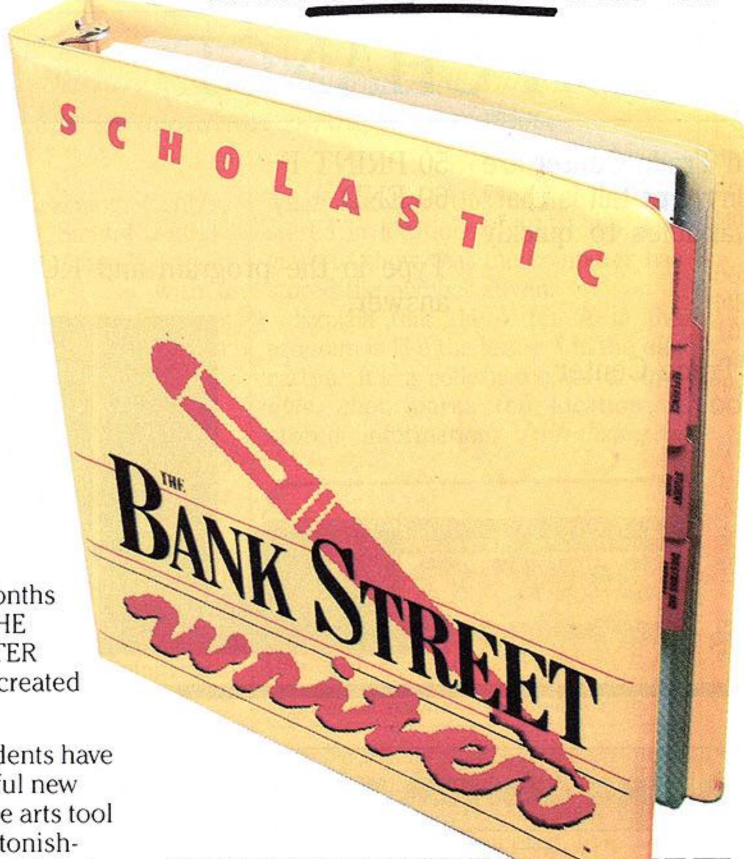

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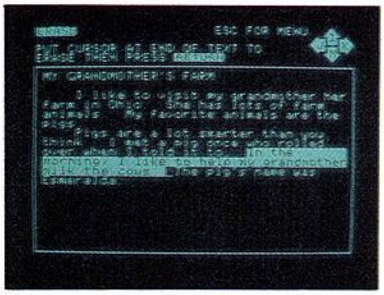

```
PUT CURSOR AT END OF TEXT TO
ERASE THEM PRESS
MY GRANDMOTHER'S FARM
     I like to visit my grandmother her
farm in Ohio.  She has lots of farm
animals.  My favorite animals are the
pigs.
     Pigs are a lot smarter than you
think.  I met a pig once who rolled
over when I told it to.  In the
morning, I like to help my grandmother
milk the cows.  The pig's name was
Esmeralda.
```

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LEARNING CENTER TASK CARD

17

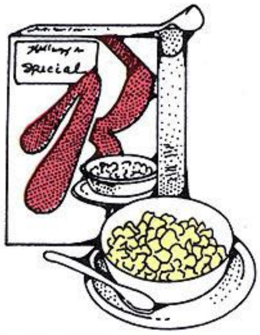
IT'S A WINNER!

Your cereal box has the winning ticket for the "I Never Win a Thing Contest." You can receive $16,000 all at once, or $175 a month for the next 96 months. You could sure use the money now, but which one is really the better deal? On a sheet of paper, write the program.

Fill in the missing parts of the program and RUN it to find your answer.

Variable List
M = Months
P = Prize
T = Total

```
NEW
10 □ = 96
20 P = □
30 T = □
40 PRINT "YOUR
TOTAL PRIZE
WOULD BE"
      INT □
60 END
```



LEARNING CENTER TASK CARD

18

WITH INTEREST

You'd like to buy a new bike, but you don't have enough money. Your sister says she'll loan you $50, the price of the bike, for one year at two percent interest per month. How much will you have to repay Sis at the end of the year? On a sheet of paper, write the program.

Fill in the missing parts of the program and RUN it to find your answer.

Variable List
L = Loan
T = Time in months
I = Interest
P = Payoff

```
NEW
10 □
20 □
30 I = .02
40 P = □ * □ * □ + L
50 PRINT "THE PAYOFF ="
60 □
70 END
```

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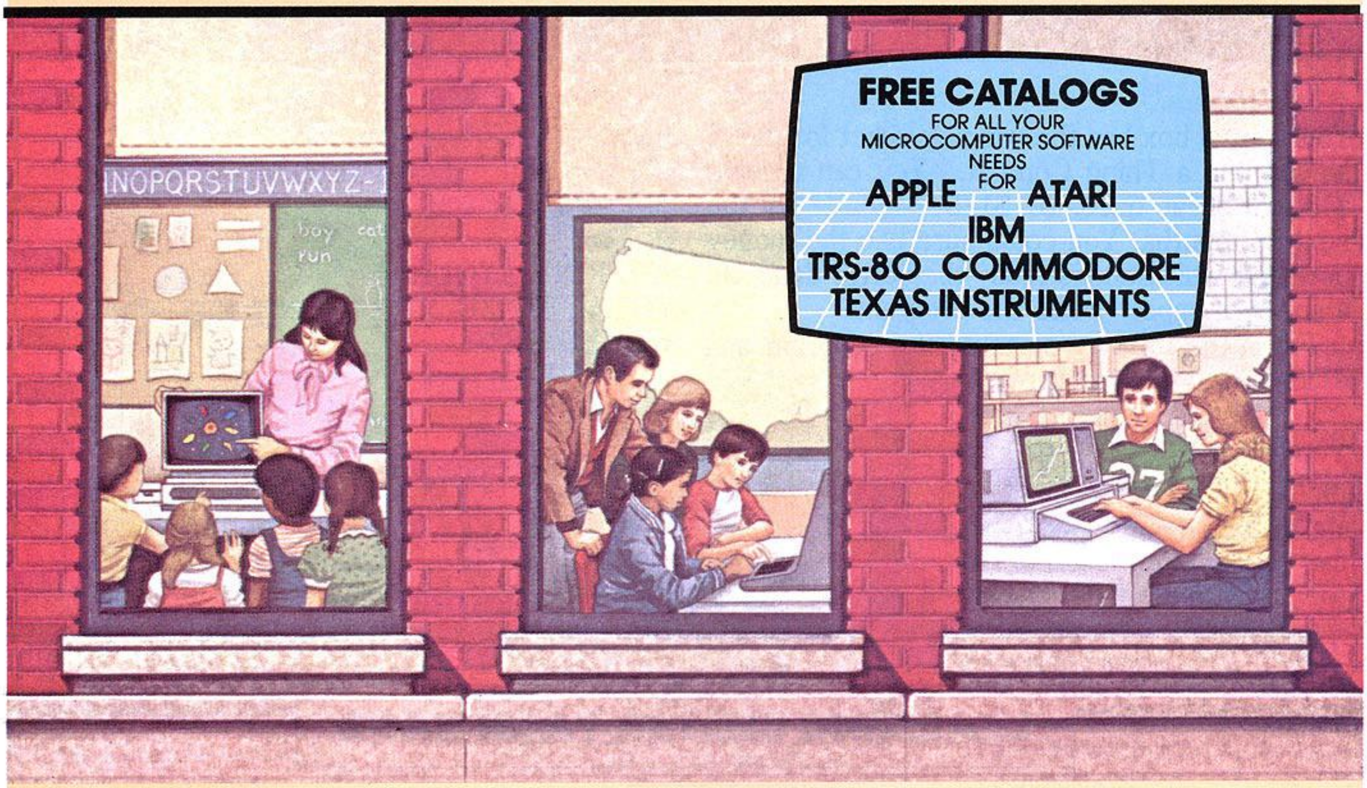

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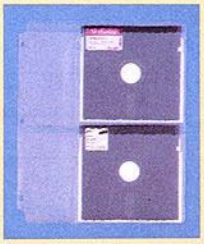

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LEARNING CENTER TASK CARD

19

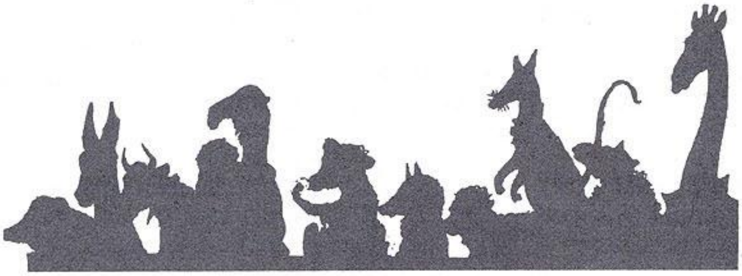
RIDDLE DECODER

Why were the elephants the last to leave Noah's Ark? Find the answer by running the program below. Be sure to type in all the letters and spaces as shown. For example, in line 30, type a space after the K and the R.

```
10 A$ = “KS”
20 B$ = “TO PA”
30 C$ = “CK THEIR ”
40 D$ = “AUSE T”
50 E$ = “HEY HAD ”
60 F$ = “TRUN”
70 G$ = “BEC”
80 PRINT G$;D$;E$;B$;C$;F$;A$
90 END
```

Notice that in line 80 semicolons hook together a group of string variables. The result is a single sentence made up of groups of letters and words.

Challenge: Make up a riddle decoder of your own using variables and semicolons.



LEARNING CENTER TASK CARD

20

INSTANT STORIES

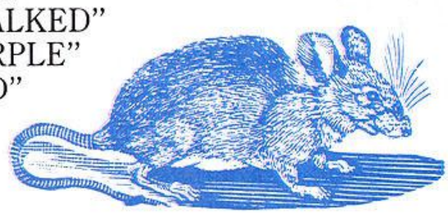
Make up a program that prints a story, using five or more of the string variables listed.

Remember to use a semicolon to hook string variables together. Here's a sample program to get you started:

```
10 B$ = “GORILLA”
20 D$ = “SCREAMED”
30 F$ = “MOUSE”
40 G$ = “RAN”
50 J$ = “RED”
60 PRINT “THE ”;F$;“ SAW A ”;J$;“ ”;B$;“.”
70 PRINT “THE ”;B$;“ ”;D$;“ AND ”;G$;
“ HOME.”
80 END
```

Variable List

A$ = “AWFUL”
B$ = “GORILLA”
C$ = “WONDERFUL”
D$ = “SCREAMED”
E$ = “LAUGHED”
F$ = “MOUSE”
G$ = “RAN”
H$ = “WALKED”
I$ = “PURPLE”
J$ = “RED”



ELECTRONIC CALENDAR—TEACHER'S GUIDE

Computing in February

By Lorraine Hopping

The February electronic calendar encourages students to think about how people will use computers in the near and distant future. This teacher's guide to the calendar offers answers and explanations for quizzes and short assignments that appear on the calendar.

February 1:
Computerized Homes

Use the poster on the back of the calendar to discuss some of the things a central computer in a computerized home can do. For more information, see the "About the Poster" section on this page.

February 4:
Computer Speed

On the chalkboard, draw a line about 13.66 inches long. Explain to students that in one *nanosecond*, light—the fastest known entity—can travel about as far as the line.

Next, draw a dot that represents one one-hundreth (.01366) of an inch. Tell students that in one *picosecond*, light can travel about as far as the dot.

Pass around a sample microchip. Explain to students that inside a computer, electrical signals pass from one circuit to the next in nanoseconds. In future computers, the signals will travel in picoseconds.

February 6:
Robots in the Workplace

Ask students what qualities a good assembly line worker has. *(Ability to concentrate, dexterity, a good attitude, ability to react to changing situations, and so on.)*

Then discuss what qualities a good factory manager has. *(Ability to make decisions and reason, organization, leadership, and so on.)*

Ask students what factory jobs are better for robots, which ones are better for people, and why. *(Robots are better for repetitious jobs that only require manual dexterity. People are better for jobs that require thinking, creativity, or personality traits such as leadership.)*

February 8:
Speech Synthesis

Speech synthesis is the ability of a computer to understand human speech. Although present-day computers recognize simple voice patterns, future computers will understand and be able to speak more complicated speech.

The device that allows computers to understand speech today is called a *speech synthesizer.*

February 16:
Artificial Intelligence

Explain to students that so far, computers only do what people program them to do.

Ask students if they think people can write programs that make a computer think and act on its own. *(No one knows.)* If so, what kind of thinking would the computer do? *(Possibly reasoning and problem solving.)* Would it get mad, imagine things, feel relieved, or go insane?

February 17:
Robot Fact and Fiction

Make a list of robots that appear in popular fiction. *(R2D2, C3PO, HAL, and so on.)* Ask students to describe the robots. Are they good robots? What can they do? How are they like people?

Ask students if they think the robots are very realistic. *(Most are not.)* What do they think real robots are like? *(Many robots are mechanical arms programmed to do one task, such as putting in a part on an assembly line.)*

February 23:
A Computerized Society

People will send paperless, electronic letters to each other directly, using a *modem.* A modem sends information over the phone lines. Instead of a mailing address, people will have special phone numbers for sending and receiving letters.

February 29:
Herman Hollerith

In 1890, Herman Hollerith invented a machine called the Hollerith Pantograph Punch. It used punched cards to tabulate data. Some of today's computers still use punched cards to process data.

About the Poster

Any of the computer uses illustrated in the poster pullout could be and *are* used in homes today. However, in the future, they will be far more prevalent.

Household computers will operate appliances like the furnace, garage door, and coffee maker through remote control devices.

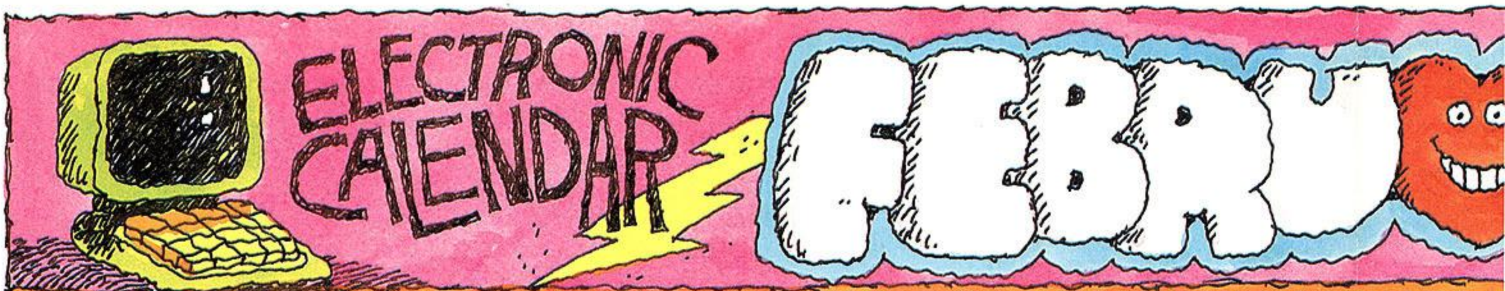
They constantly will check various sensors around the house to ensure that everything is all right. If a fire starts or someone breaks into the house, a computer will sound a buzzing alarm or actually speak words of warning.

Computers will not only wake you up, but will also provide a weather report, remind you of appointments, make banking transactions, and offer catalog services for shopping.

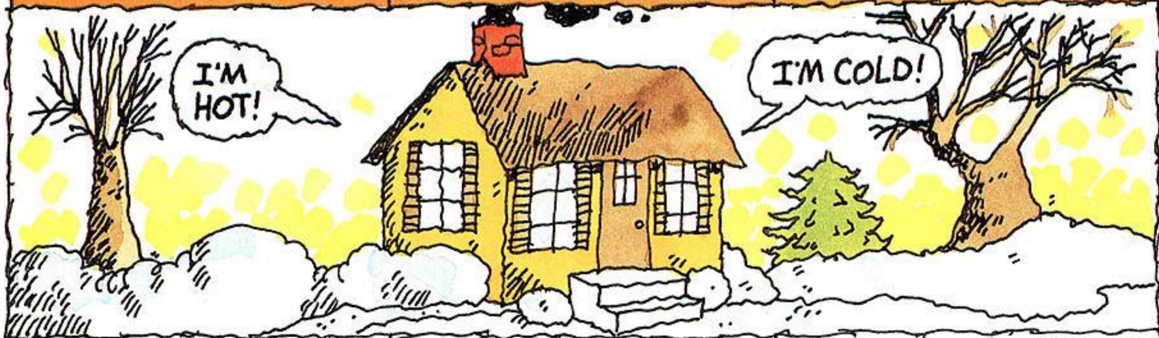
A video camera linked to a computer will enable people to see who's at the front door, or what the baby's doing in the nursery, from anywhere in the house.

Electronic robots will vacuum, mow the lawn, wash windows, and shovel snow. ■

Lorraine Hopping is assistant editor for *Teaching and Computers.*



SUNDAY MONDAY TUESDAY WEDNESDAY


I'M HOT!
I'M COLD!

1

Quick Quiz
Some day computer will have sensors al over your house. Th sensors will be able t "sense" when it's to cold and the compute will turn on the hea What else will thes sensors detect? (Se this month's poster.

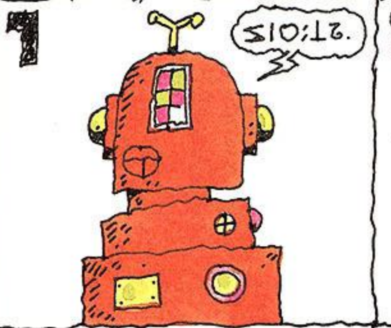
5

HELLO.
FOR HIRE

6

Try This!
Suppose you're a factory boss in the year 2001. Would you hire robots or people? Make a list of pros and cons for each.

7



8

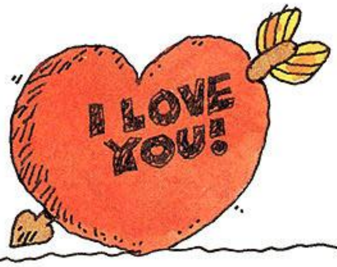
Quick Quiz
In the future, you'll b able to talk to com puters and they'll tal back! What do you ca this ability?

12 **LINCOLN'S BIRTHDAY**

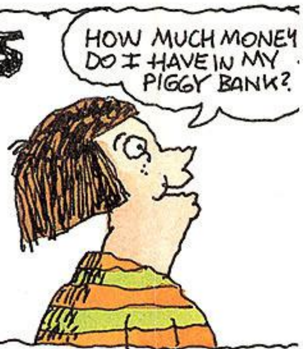
13

Future Fact
In the future, people with heart trouble might have tiny computers in their bodies that will control their hearts!

14 **VALENTINE'S DAY**



15


HOW MUCH MONEY DO I HAVE IN MY PIGGY BANK?

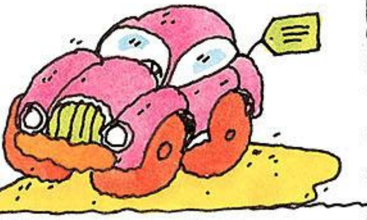
19

Joke Day
Q: Why was the baby computer crying?
A: It lost its data. (Da Da)

20

Future Facts
Before long, most people will shop for food, clothes, and even cars by computer—without leaving home!
home!

21



22 **WASHINGTON'S BIRTHDAY**

HAPPY BIRTHDAY GEORGE

26

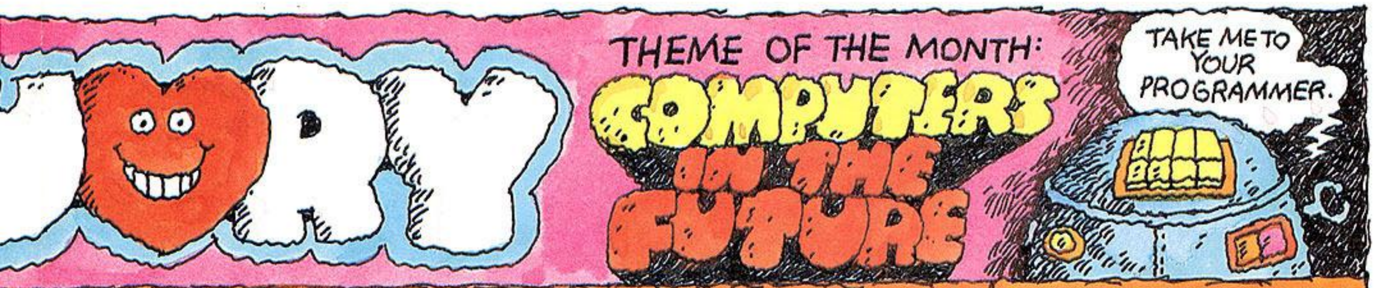
27

28

Future Facts
Instead of snow days, some schools will have home days! You'll stay home all day and work on a computer. Teachers will know if you are "playing hooky" by asking the computer!

29

Herman Hollerith Birthday
Find out who Herma Hollerith was a how his inventi helped in the creati of computers.



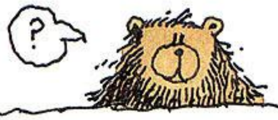
NESDAY | THURSDAY | FRIDAY | SATURDAY

ck Quiz
e day computers have sensors all your house. The ors will be able to se" when it's too and the computer turn on the heat. t else will these ors detect? (See month's poster.)

2 **Ground Hog Day**

Q: Why didn't the groundhog come out on February 2?

A: Because it couldn't remember its password.



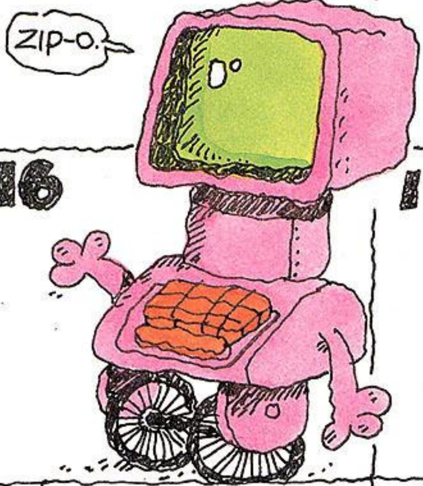
3

4 **Word Day: Nanosecond, Picosecond**

A **nanosecond** is one billionth of a second. Computers do math problems in nanoseconds. A **picosecond** is one trillionth of a second. Future computers will do problems in picoseconds!

ck Quiz
he future, you'll be to talk to computers and they'll talk ! What do you call ability?

9



10 **Future Fact**

Some future monitors will be big and thin like movie screens! Others will be as tiny as watches!

11 **Joke Day**

Q: What did the programmer say to the roller coaster?

A: Gee whiz! You sure threw me for a loop!

OW MUCH MONEY
O I HAVE IN MY
PIGGY BANK?

16

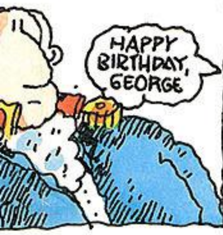
17 **Word Day: Artificial Intelligence**

A computer that is programmed to make decisions on its own has **artificial** (fake) **intelligence**. Do you think computers will ever be smarter than humans?

18 **Try This!**

Future robot "heroes" will rescue people from fires, repair spaceships in space, and deactivate bombs. Write a story about a robot hero that saves peoples' lives. Is there anything it *can't* do?

SHINGTON'S THDAY



23 **Quiz Day**

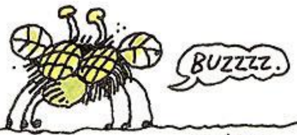
By the year 2000, your town post office may disappear. But you'll still get letters! Do you know how?

24

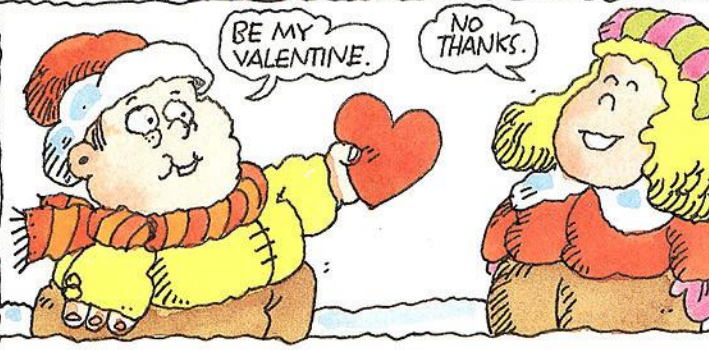
25 **Joke Day**

Q: What was a bug doing in the computer program?

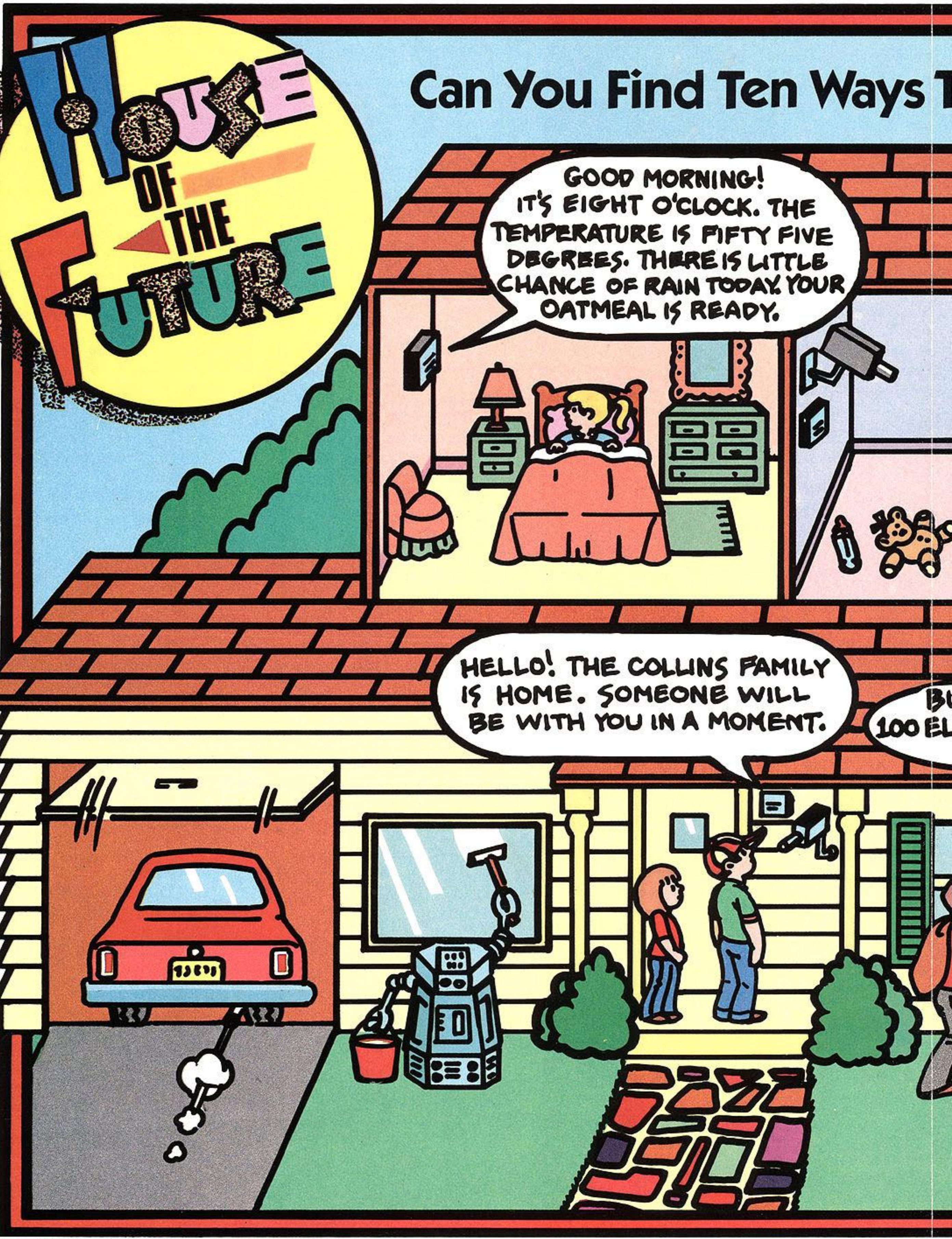
A: Looking for a byte to eat.



rman Hollerith's thday
d out who Herman lerith was and his invention ped in the creation omputers.

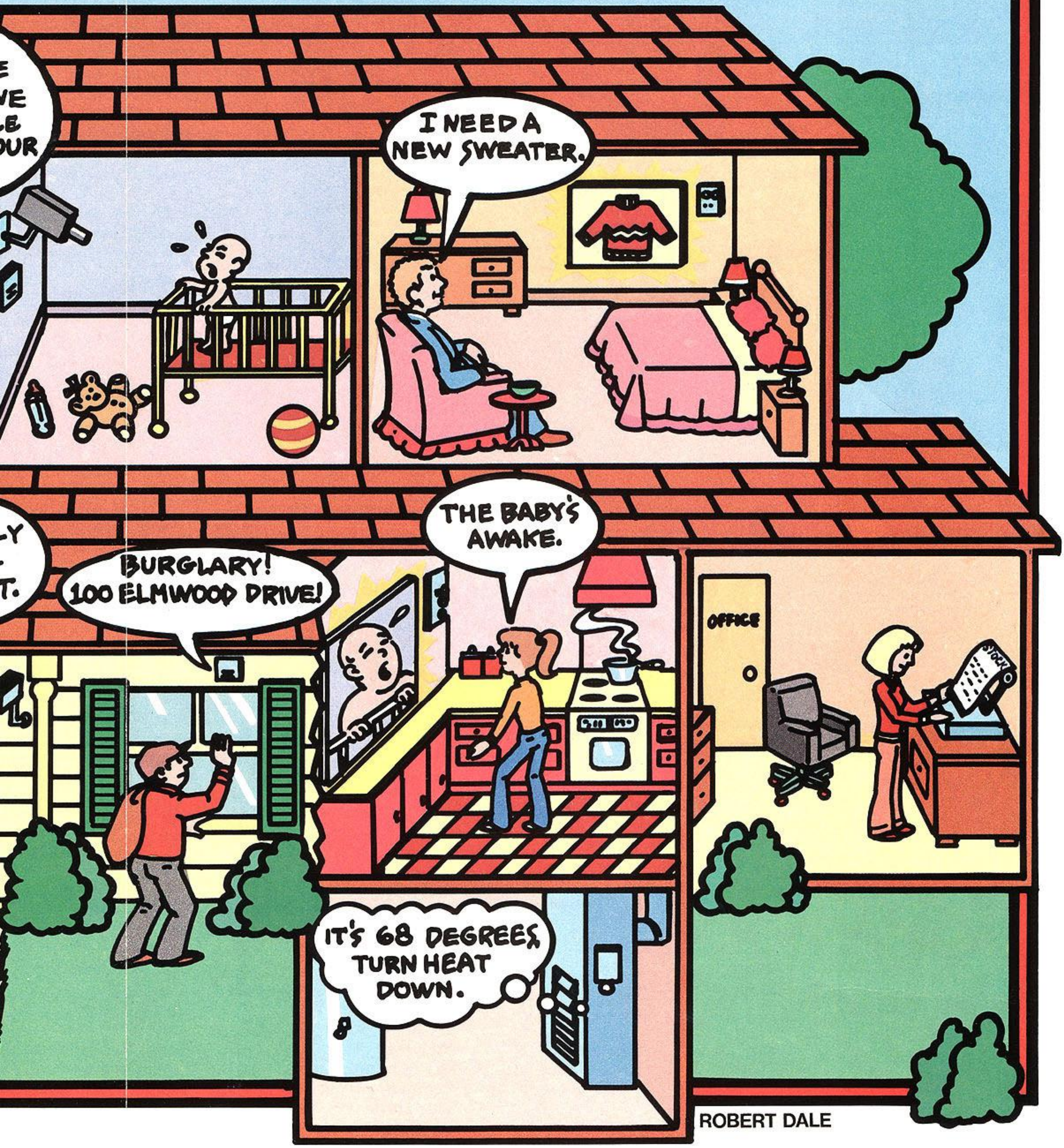

BE MY VALENTINE.
NO THANKS.

Can You Find Ten Ways T


HOUSE OF THE FUTURE
GOOD MORNING! IT'S EIGHT O'CLOCK. THE TEMPERATURE IS FIFTY FIVE DEGREES. THERE IS LITTLE CHANCE OF RAIN TODAY. YOUR OATMEAL IS READY.
HELLO! THE COLLINS FAMILY IS HOME. SOMEONE WILL BE WITH YOU IN A MOMENT.
BU
100 EL

Teaching and Computers Poster Series
Published by Scholastic Inc.

Ways This Household Uses Computers?


E
VE
LE
OUR
I NEED A NEW SWEATER.
Y
T.
BURGLARY! 100 ELMWOOD DRIVE!
THE BABY'S AWAKE.
OFFICE
STOCK
IT'S 68 DEGREES, TURN HEAT DOWN.

ROBERT DALE

KID'S PAGE

Look What I Can Do!

I can make a heart beat fast or slow! Can you? Here's my *Beating Heart* program listing:

```
1 CLS
5  REM  VALENTINES
10  PRINT "    * * * *"
20  PRINT "   *   *   *"
30  PRINT "   *       *"
40  PRINT "   *       *"
50  PRINT "    *     *"
60  PRINT "     *   *"
70  PRINT "      * *"
80  PRINT "       *"
90  FOR T = 1 TO 200: NEXT T
100 CLS
110  PRINT "   * *   * *"
120  PRINT "  *   * *   *"
130  PRINT " *     *     *"
140  PRINT " *           *"
150  PRINT " *           *"
160  PRINT "  *         *"
170  PRINT "   *       *"
180  PRINT "    *     *"
190  PRINT "     *   *"
200  PRINT "      * *"
210  PRINT "       *"
220  FOR T =1 TO 200: NEXT T
230 CLS
240  GOTO 5
```

Type in the program listing exactly as it appears. Be sure to count the number of spaces and asterisks in each PRINT statement.

Then type RUN and watch the heart beat, beat, beat....

To stop the heart, press the BREAK key, or press CTRL and C at the same time.

Beating Heart Superchallenge

- Can you make the heart beat real fast? Delete lines 90 and 220.
- Make the heart beat in slow motion. Change lines 90 and 220 to: FOR T = 1 TO 1000: NEXT T. Try other numbers for T and see what happens.
- You can write a special valentine message next to the heart by adding these lines:

85 PRINT: PRINT: PRINT "MY HEART BEATS FOR YOU!"

215 PRINT "MY HEART BEATS FOR YOU!"

Becky Cook
Wayne, MI

Joke File

Q: What's the most ambitious part of a computer?
A: The disk—it's got drive.

Thomas Baker
Pittsburgh, PA

Q: What do Hawaiian computers do for fun?
A: They go keyboarding.

Jacob White
Sandy, OR

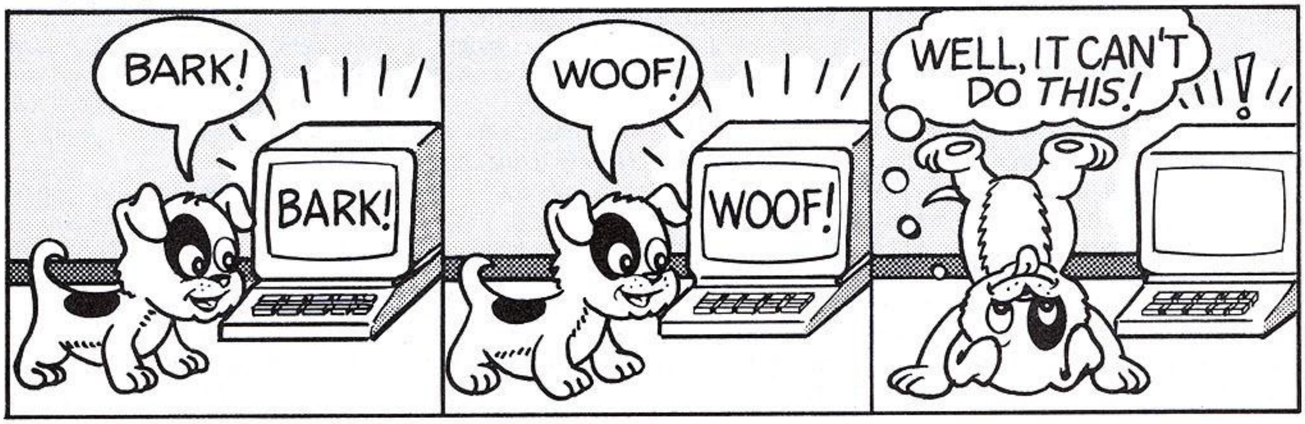
Q: Why did the computer join the police force?
A: It wanted to take a byte out of crime.

Jan Blair
Kensington, MD

Calling All Kids!

Send your computer tricks and jokes to Kid's Page, *Teaching and Computers,* 730 Broadway, New York, NY 10003. We might publish them in the Kid's Page, so remember to include your name, grade, and address. ■

Nibbles



BARK!
BARK!
WOOF!
WOOF!
WELL, IT CAN'T DO THIS!
Robert Dale

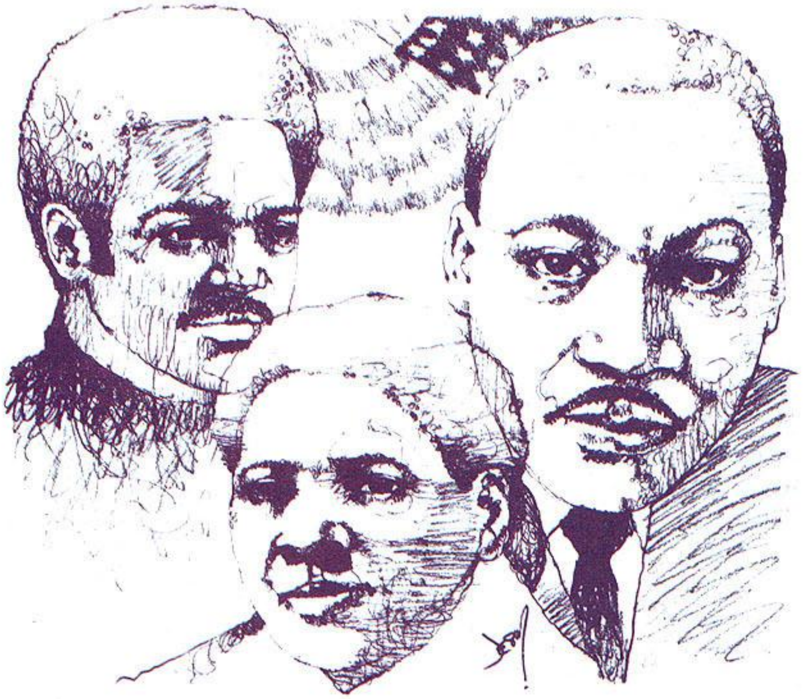
Uses: copy machine, opaque projector, or transparency master for overhead projector. Scholastic Inc. grants teacher-subscribers of *Teaching and Computers* permission to reproduce these pages for use in their classrooms. Copyright © 1984 by Scholastic Inc.

Teacher's Notes: Change lines 1, 100, and 230 in the program to HOME for Apple computers; PRINT CHR$(147) for Commodore computers; and PRINT CHR$(125) for Atari computers.

PROGRAM OF THE MONTH

Black American History Quiz

By Lorraine Hopping


Jesus G. Silva

Celebrate Black American History Month with this challenging quiz program on four famous black leaders.

February is Black American History Month, and in honor of Black Americans and their heritage, this month's program quizzes students on four famous black leaders: Harriet Tubman, Frederick Douglass, Ida B. Wells, and Dr. Martin Luther King, Jr.

You may wish to use *Black American History Quiz* to supplement a unit on famous black leaders. Or you could expand the program to include information on several other black Americans who helped make history.

How the Program Works

Black American History Quiz generates up to five clues, one at a time, on each of the four leaders. Students try to guess the name of each leader, using as few clues as possible. When students type in their guesses, they must spell out the person's full name correctly. If students spell the name incorrectly, the computer rejects the guess.

Using the Program in the Curriculum

To give students an introduction to events, people, and issues in Black American history, have them read at least one history book on the subject. (See bibliography, page 48.)

- As a class project, construct a *Who's Who of Black American History*. Have each person pick a black civil rights leader, politician, writer, educator, scientist, scholar, musician, sports star, or other figure on whom to write a short biography. Alphabetize and assemble the biographies in book form, complete with index.

  Add the *Who's Who* entries to the *Black American History Quiz* program. (See "Expanding the Program," next page.)
- Have students read black fiction or poetry. (See bibliography, page 48.) As a class, discuss issues raised by the books, such as discrimination, civil rights, segregation, busing, and slavery.
- Using Alex Haley's *Roots* as an example, tell students that some authors recreate historical events accurately and realistically using both fact and fiction. This *historical fiction* often takes the form of a short story, novel, poem, speech, play, or screenplay.

  Have students pick a time, place, event, or person about which to write a short piece of historical fiction, using any medium they choose. Encourage students to collaborate on projects to make a television miniseries or a short, historical novel in which each person writes a chapter.

  One project might be an epic poem about Phillis Wheatley, a black woman born in Senegal, Africa, in the 1700s, who came to America as a child slave and later wrote her way to freedom as a poet. Another project could be a historical drama about Crispus Attucks, the first martyr of the Boston Massacre, and the events that led up to his death. Other suggestions include: diary entries by Abe Lincoln while in office, a speech written by a civil rights protester, a news story published in an 1865 newspaper, and a screenplay about a black family in the 1980s.
- Discuss the phrase "separate but equal." Explain that, in the late 1800s and early 1900s, many states had *Jim Crow laws*. These laws required blacks and whites to use separate public facilities, such as schools, churches, restaurants, hotels, buses and trains, public toilets, and so on.

  In 1896, in the case of *Plessy v. Ferguson*, the Supreme Court ruled that these "separate but equal" facilities for blacks and whites were constitutional.

  In 1954, however, the Supreme Court ruled, in the case of *Brown v. Board of Education of Topeka*, that public schools were separate, but not equal. Most black schools were inferior to white schools, and so blacks did not have the same opportunity for

(continued on page 48)

Program Listing for *Black American History Quiz* This program listing is for Apple computers. To convert for Atari, Commodore, Radio Shack, and Texas Instruments computers, see chart, page 68.

```
1  HOME
5  REM  BLACK HISTORY QUIZ
10  PRINT "   DO YOU NEED INSTRUCTIONS? (TYPE 'Y'"
20  PRINT "FOR YES AND 'N' FOR NO. PRESS RETURN.)"
30  INPUT I$
40  IF I$ = "Y" THEN  GOSUB 2000
50  GOSUB 200
60  GOSUB 1000
70  GOSUB 300
80  GOSUB 1000
90  GOSUB 400
100  GOSUB 1000
110  GOSUB 500
120  GOSUB 1000
130  HOME
140  PRINT "DO YOU WANT TO PLAY AGAIN? (TYPE 'Y' FOR"
150  PRINT "YES AND 'N' FOR NO. PRESS RETURN.)"
160  INPUT I$
170  IF I$ = "Y" THEN  GOTO 1
180  PRINT "GOODBYE 'TIL NEXT TIME...."
190  END
200  REM  HARRIET TUBMAN
210 C$(1) = "I WAS BORN A SLAVE IN MARYLAND IN 1820."
220 C$(2) = "I AM THE MOSES OF MY PEOPLE."
230 C$(3) = "I ESCAPED BY THE UNDERGROUND RAILROAD."
240 C$(4) = "I HELPED 300 OTHER SLAVES ESCAPE."
250 C$(5) = "I NURSED AND SCOUTED IN THE CIVIL WAR."
260 A$ = "HARRIET TUBMAN"
270  RETURN
300  REM  FREDERICK DOUGLASS
310 C$(1) = "AS A YOUNG SLAVE, I WORKED ON A SHIP."
320 C$(2) = "MY MASTER'S WIFE HELPED EDUCATE ME."
330 C$(3) = "I ESCAPED AND CHANGED MY NAME IN 1838."
340 C$(4) = "I SPOKE AGAINST SEGREGATION AND RACISM."
350 C$(5) = "I FOUNDED AN ANTISLAVERY NEWSPAPER."
360 A$ = "FREDERICK DOUGLASS"
370  RETURN
400  REM  MARTIN LUTHER KING JR.
410 C$(1) = "I FOUGHT INJUSTICE BY PEACEFUL MEANS."
420 C$(2) = "I WAS A BAPTIST MINISTER FROM GEORGIA."
430 C$(3) = "I WON THE NOBEL PEACE PRIZE IN 1964."
440 C$(4) = "I LED MARCHES AND SPOKE ON CIVIL RIGHTS."
450 C$(5) = "I WAS ASSASSINATED ON APRIL 4, 1968."
460 A$ = "MARTIN LUTHER KING JR."
470  RETURN
500  REM  IDA B. WELLS
510 C$(1) = "AT 14, I TAUGHT SCHOOL IN MISSISSIPPI."
520 C$(2) = "I SAT IN A 'WHITES-ONLY' RAILROAD CAR."
530 C$(3) = "I PUT OUT A PAPER CALLED 'FREE SPEECH.'"
540 C$(4) = "I HEADED AN ANTI-LYNCHING CAMPAIGN."
550 C$(5) = "I FOUNDED THE NEGRO FELLOWSHIP LEAGUE."
560 A$ = "IDA B. WELLS"
570  RETURN
1000  REM  GIVE CLUES
1010  FOR N = 1 TO 5
1020  HOME
1030  PRINT C$(N)
1040  PRINT : PRINT "WHO AM I?"
1050  PRINT : PRINT "(ENTER THE FULL NAME AND PRESS RETURN.)"
1060  INPUT G$
1070  IF G$ = A$ THEN 1200
1080  PRINT : PRINT "    SORRY, THAT'S NOT WHO I AM."
1090  PRINT : PRINT "    (CHECK YOUR SPELLING FOR ERRORS.)"
1100  FOR T = 1 TO 4000: NEXT T
1110  NEXT N
1120  HOME
1130  PRINT "   MY NAME IS ";A$;"."
1140  FOR T = 1 TO 2000: NEXT T
1150  HOME
1160  RETURN
1200  HOME
1210  PRINT "   YOU GOT IT!  CONGRATULATIONS!"
1220  PRINT : PRINT "    I AM, INDEED, ";A$;"."
1230  FOR T = 1 TO 4000: NEXT T
1240  RETURN
2000  REM  INSTRUCTIONS
2005  HOME
2010  PRINT "  THIS IS A QUIZ PROGRAM ON FOUR GREAT"
2020  PRINT "LEADERS IN BLACK HISTORY."
2030  PRINT : PRINT "  THE COMPUTER WILL GIVE YOU UP TO FIVE"
2040  PRINT "CLUES ON EACH LEADER, AND YOU WILL HAVE"
2050  PRINT "TO GUESS WHO IT IS."
2060  PRINT : PRINT "REMEMBER TO SPELL OUT THE FULL NAME"
2070  PRINT "CORRECTLY TO MAKE IT COUNT."
2080  PRINT : PRINT "(PRESS RETURN TO START
                THE QUIZ.)": INPUT Z$
2090  HOME
2100  RETURN
```

(continued from page 46)

education as whites. In 1969, the Court ordered schools to *desegregate*.

●Choose nine class members to represent judges of a newly formed Supreme Court.

Divide the rest of the class in half for a debate on the "separate but equal" issue. To find arguments on both sides, have debaters research the Supreme Court cases mentioned above; speeches by civil rights supporters and attackers; and the Constitution, including the Civil Rights Act and the first 10 amendments.

After the debate, have the judges issue a written ruling, explaining all sides of the issue and deciding by majority vote whether "separate but equal" in all facilities is constitutional or not.

Expanding the Program

Expand *Black American History Quiz* to include other figures in history, such as George Washington Carver, Abraham Lincoln, Sojourner Truth, W.E.B. Du Bois, and so on.

Here's an example of how to expand the program to include George Washington Carver. First add five clues to the program as follows:

```
600 REM GEORGE WASHINGTON CARVER
610 C$(1) = "I WAS BORN IN MISSOURI IN 1864."
620 C$(2) = "I WAS KIDNAPPED AND SOLD AS A SLAVE."
630 C$(3) = "I BECAME A BOTANIST AND SCIENTIST."
640 C$(4) = "MY WORK IMPROVED THE SOUTH'S ECONOMY."
650 C$(5) = "I FOUND OVER 300 USES FOR THE PEANUT."
660 A$ = "GEORGE WASHINGTON CARVER."
670 RETURN
```

Next, add two GOSUB commands:

```
121 GOSUB 600
122 GOSUB 1000
```

In the first subroutine, the computer retrieves the clues listed above. In the second, the computer lists the five clues, one at a time, until the player guesses the person's name or runs out of clues.

RUN the program to check for errors.

Add other subjects on lines 700, 800, and 900.

> *Harriet Tubman, known as the Moses of her people, led 300 slaves to freedom via the Underground Railroad.*

Bibliography

Nonfiction

Black Frontiersmen: Adventures of Negroes Among American Indians, 1528–1918, by Norman Heard, (Harper & Row: 1969), grade 6 and up.

Black History: Events in February, by Ida S. Meltzer, (Book-Lab, Inc.: 1972), grades 4–12.

Black Pioneers of Science & Invention, by Louis Haber (Harcourt Brace Jovanovich: 1970), grade 5 and up.

Blacks in Early American History, by Ida S. Meltzer, (Book-Lab, Inc.: 1972), grades 4–9.

The Color Your Way into Black History Book, by Adrienne Sealy, (The Association for Family Living: 1980), workbook.

The Ebony Book of Black Achievement, by Margaret Peters, (Johnson Publishing Co., Inc.: 1974), grades 4–8.

Junior History of the American Negro, by M.C. Goodman, (Fleet Press Corp.: 1969–70), grades 6–12.

They Showed the Way: Forty American Negro Leaders, by Charlemae Rollins, (Harper & Row: 1964), grade 4 and up.

Fiction

Apples on a Stick, by Barbara Michels and Bettye White, (Putnam Publishing Group: 1983), grades 3–6.

Black Crusaders for Freedom, by Bennett Wayne, (Garrard Publishing Co.: 1974), grades 5–12.

By Secret Railway, by Enid La Monte Meadowcroft, (Scholastic Inc.: 1969), grade 6 and up.

Guests in the Promised Land, by Kristin Hunter, (Scribner & Sons, Inc.: 1973), grade 5 and up.

Home is Over the Mountains: The Journey of Five Black Children, by James Streeter, (Garrard Publishing Co.: 1972), grades 3–6.

My Name is Black: Anthology of Black Poets, edited by Amanda Ambrose, (Scholastic Inc.: 1973), grade 3 and up.

Song About Black, by Ann McGovern, (Scholastic Inc.: 1970), grades 2–5.

Striped Ice Cream!, by Joan M. Lexau, (Scholastic Inc.: 1968), grade 4 and up.

Two Tales in Afro-American History, by Jon Rice, (The Committee: 1982).

Send program listings, descriptions, and tips for classroom use to Program of the Month, *Teaching and Computers*, 730 Broadway, New York, NY 10003. ■

Lorraine Hopping is assistant editor for *Teaching and Computers*.

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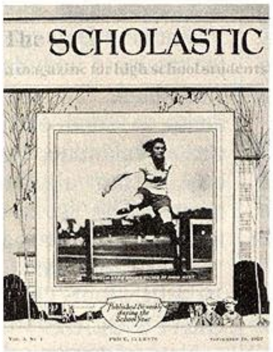

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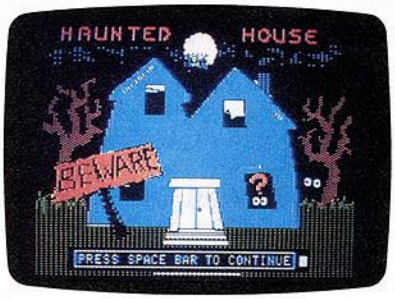

Microzine Premiere Issue, Haunted House: An Interactive Story. Computer graphics by Technigraphics. Designed and developed by Information Technology Design Associates.

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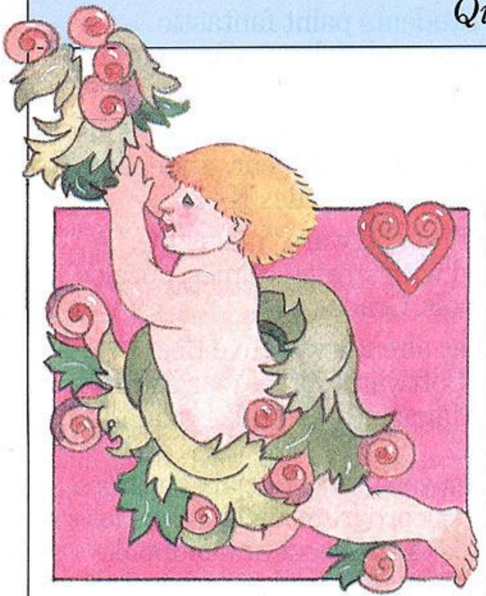
MICRO IDEAS

Quick Computer Tips and Activities



Decorate a Valentine Printout

Cupids and hearts, sweet songs and poems. Everyone's thoughts turn to love on February 14. This activity lets your students express what love is to them and at the same time create an attractive door decoration.

On the chalkboard write "LOVE IS . . . " and ask your students to fill in the blank. You'll probably have to start them off by giving examples of what "love is" to you. Once your students start to express themselves, select one student to write their ideas into the computer. For example:

```
10 PRINT "LOVE IS . . . "
20 PRINT "A DOG NAMED SAM-
SON."
30 PRINT "SHARING CANDY
WITH MY SISTER."
40 PRINT "HELPING MOM WITH
THE DISHES."
50 END
```

After each student has contributed two or three examples, type RUN and press ENTER or RETURN. This will display the list so the class can check for spelling errors.

When you've corrected all spelling errors, make a printout of the list. Your students can decorate the printout with hearts, cupids, and flowers. Hang the printout on your door as a valentine from your class to the rest of the school. ☐

Mary Ellen Quinn
Richmond, VA

Increase Vocabulary with Disk Match

The Disk Match game can increase your students' computer vocabulary list and at the same time reinforce the correct procedure to insert a floppy disk into a disk drive.

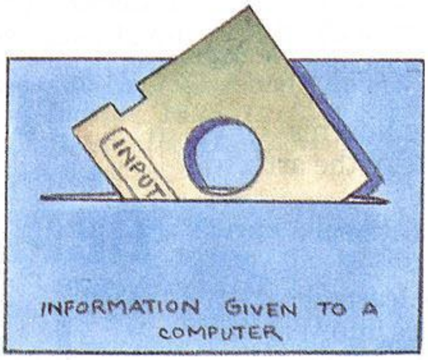
Using construction paper, cut three-inch-by-four-inch rectangles with three-inch horizontal slots in the center; these are the disk drives. Write a definition of a computer word on each disk drive. For example, "information given to a computer."

To make the floppy disks, cut two-inch squares and draw circles in the center. On the bottom, write computer vocabulary words to match the definitions on the disk drives. For example, the disk with the word "input" would match the sample disk drive definition given above.

Display the disk drives on the chalkboard shelf and hand out a disk to each student. Have the students choose the disk drive definition that matches their disk word by slipping the disk into the disk drive. You can make this game self-correcting, by writing the correct disk word on the back of each disk drive.

Your students' computer vocabulary should increase with each round of Disk Match. ☐

Cyndi Berndt
Angola, IN


INPUT
INFORMATION GIVEN TO A COMPUTER

When students play Disk Match, they practice inserting disks and learn computer vocabulary words.

Make Sure Every Student Receives a Valentine

Valentine's Day can be disappointing for students who don't receive many valentines. To encourage my students to send each member of the class a valentine, I give them a printout listing all their classmates' names. The list is easy to make. In fact, we make it together.

First I type in:

```
10 PRINT "STUDENTS IN MRS.
GRAY'S CLASS"
```

Next, I have each student type in his or her own name.

```
20 PRINT "STACY DAVIS"
30 PRINT "MATT BEAMER"
40 PRINT "ERIN O'DONNELL"
```

When all the names are entered we type RUN and press ENTER or RETURN. Our student list will appear on the screen. We review the list to be sure everyone's name is included and printed correctly. Then I make a printout for each student. ☐

Marge Gray
Boston, MA

Quick Tips

These quick tips were shared with *Teaching and Computers* during a recent visit to St. Anne's-Belfield School in Charlottesville, VA.

- If your students sometimes have a difficult time settling down to work on the computer, try turning off the lights. A darkened classroom not only helps students see the monitor better; it also signals that it's time to get down to business.
- Give each student a personal disk at the beginning of the year, so they can store their own files and keep track of their own progress. This may also help students feel a sense of pride and accomplishment about their work.
- Use old computer punch cards as flash cards to help younger students learn computer vocabulary. Write the computer word on one side and the definition on the other. ☐

Susan Gaber

Start a Computer Scrapbook

To help my students become aware of all the professional uses of the computer, we've started a computer scrapbook.

Each week, students bring to class newspaper and magazine articles which discuss various uses of the computer. I set aside 20 minutes each week to talk about the articles and then I paste them into a notebook. Students may look at the scrapbook while they're waiting for their turn to use the computer.

When my students read about how computers are used in different professions, such as medicine or business, they begin to think about future career possibilities. □

Lisa Martin
Pittsburgh, PA

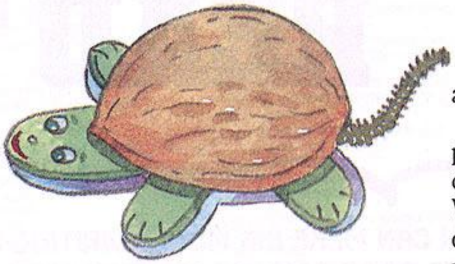
Break Down a Job

A computer program must be broken down into individual steps for the computer to understand it. Try this group activity to encourage your students to think about all the steps involved to complete a job.

On slips of paper, write mystery jobs, such as "tying shoes" or "brushing teeth." Pass out one job to each student and instruct the class to write down each step necessary to get the job done. If questions arise, such as "Which lace goes where?" or "How much toothpaste is enough?" let the students make the decisions necessary to complete the job.

After the students have finished listing all the steps, they should read them aloud so the class can guess their mystery jobs. Were any steps overlooked? You can count on some picky responses. □

Sandra Markle
Dunwoody, GA



Make Logo Turtles From Walnut Shells

To use Logo's turtle graphics, students need to understand the concepts of right, left, forward, and backward. This craft project lets every student make his or her very own "pseudo-turtle," which can be used to practice moving Logo's turtle in different directions.

Give each student a cracked walnut to hollow out. Have students glue on felt features for a face and glue a pipe cleaner to one end of the shell as a tail.

When the walnut turtles are complete, have one student call out the commands RIGHT, LEFT, FORWARD, and BACKWARD at random. The other students should move their turtles accordingly.

When using the real turtle graphics, students will sometimes want to move the turtle without drawing. The PENUP command will allow them to do this. Have students bend their walnut turtles' tails up to demonstrate the PENUP command. When the turtles should begin drawing again, students can bend the tails down (PENDOWN). Because the tail will be doing a lot of work, be sure to use strong glue. □

Eleanor Zimmerman
Lock Haven, PA

Set Up a Disk Directory

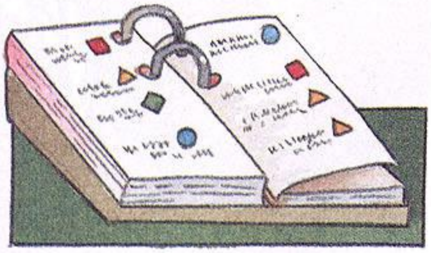
As my software stash grew larger and larger, I found it more and more difficult to locate programs on specific topics quickly. To add to the confusion, many of the disks in our classroom contained several programs each—often on completely different topics!

To keep track of the programs our classroom software offered, I developed a quick and efficient Disk Directory I can thumb through to select the disks I need.

On separate pieces of paper, slightly smaller than a desk calendar base, I wrote the name of each program we had, what disk or cassette it was on, and a brief description of the program's contents.

Then I bought small adhesive labels of dots, rectangles, and squares in several colors. I assigned each subject area a color. For example, math is green; spelling is yellow; social studies, blue.

Program type is indicated by the shape of the sticker. Dots designate drill and practice programs, squares stand for simulations, and rectangles, for tutorials.



On the upper right corner of each software description, I stuck the appropriate label. For example, if a program was a spelling drill and practice, I placed a yellow dot on it. If it was a math tutorial, it got a green rectangle. (I decided that this color coding system would let me find software I needed at a glance.)

Finally, I inserted the software pages alphabetically, into a two-ring calendar desk frame.

You can make directories to classify the disks in other ways, too. Why not have a directory by grade level, machine compatibility, and type of program . . . ? □

Jean Foster
Marion, OH

(continued on page 53)

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☐ c. Junior High
☐ d. Senior High
☐ e. Junior/Senior
☐ f. College
☐ g. District
☐ h. State
☐ i. Federal/National
☐ j. Other

II. Your primary job (check one)
☐ 1. Administrative (including Superintendent/Principal)
☐ 2. Teaching (including Department Head)
☐ 3. Evaluation/Purchasing
☐ 4. Curriculum Development
☐ 5. Media Specialist/Librarian
☐ 6. Other

III. What is your primary involvement with computers?
☐ a. Actively use computers
☐ b. Recommend type/brand
☐ c. Approve purchase
☐ d. General interest
☐ e. All of the above

IV. Your school or district's investment in electronic learning materials.
☐ 1. Increasing
☐ 2. Decreasing
☐ 3. No Change

V. In which area does your school or district use computers? (check one)
☐ a. Interdisciplinary (elementary classroom)
☐ b. Math
☐ c. Reading
☐ d. Science
☐ e. Business/Vocational Education
☐ f. Computer Sciences
☐ g. Social Sciences
☐ h. English/Language Arts
☐ i. Other

VI. How does your school or district use computers?
☐ 1. Primarily for administrative purposes
☐ 2. Primarily for instructional purposes

VII. What type of software has your school/district purchased in the past year?
☐ a. Curriculum-based courseware
☐ b. Fun/Learning software
☐ c. Word Processing
☐ d. Utility
☐ e. Programming

VIII. Your school/district enrollment
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☐ 3. 500–999
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☐ 7. 25,000 +

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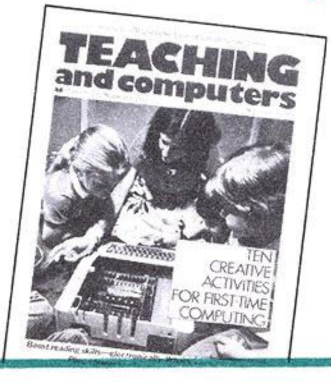

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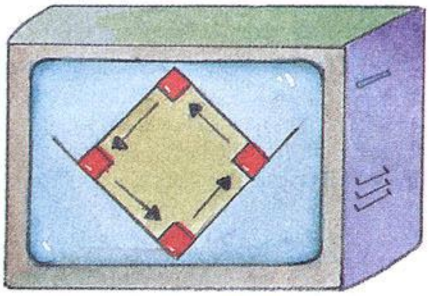
Play Turtle Baseball

To help students practice the basic commands for the Logo turtle, I've developed "Turtle Baseball." The program listed below creates a baseball diamond on the screen.

```
10 TO BASEBALL
20 FULLSCREEN
30 PU BK 80 PD
40 TO BASES
50 TO FOUL.LINES
60 TO BATTER.BOX
70 END
80 TO BASES
90 RT 45
100 REPEAT 4 [FD 80 LT 90 REPEAT 4 [FD 10 LT 90]]
110 END
120 TO FOUL.LINES
130 FD 155 LT 60
140 REPEAT 75 [FD 4 LT 2]
150 LT 60 FD 155 LT 90
160 END
170 TO BATTER.BOX
180 LT 45 PU BK 15 PD
190 END
```



This program can be used with Apple Logo and MIT logo. For TI logo, omit the fullscreen command.

When the program is ready, divide the class into two teams and select a batter for each team. Watch as teammates cheer the batter on, suggesting the commands needed to round the bases. The first batter to reach home plate gains a point for his or her team. Tally points after every student has had a turn at bat. The team with the most points wins. □

Gini Shimabukuro
Oakland, CA

Walk in the Computer's Shoes

When you walk a mile in someone else's shoes, you can learn a lot about that person. In this exercise, let your kids walk in the computer's shoes and discover that the computer can only process one piece of information at a time.

On the chalkboard write:

```
10 PRINT "WHAT IS YOUR NAME?"
20 INPUT A$
30 PRINT "HOW OLD ARE YOU?"
40 INPUT B$
50 PRINT A$
60 PRINT B$
70 GOTO 10
```

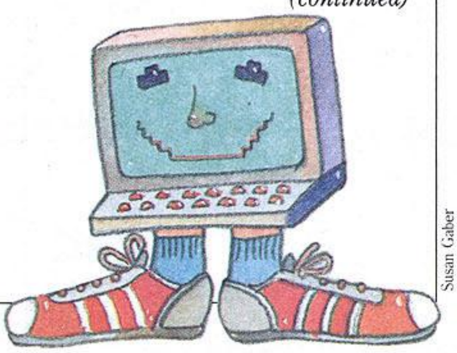
In the front of the class place two boxes, one labeled A, the other, B. Select one student to call out the commands. Choose another student to answer the questions contained in the command. The third will write each answer on a sheet of paper and place it in the box, while the fourth student displays it by writing it on the chalkboard.

Repeat this exercise with another group. Each time a new answer is given, erase the old answer on the chalkboard. Kids will discover that while many answers can be stored in the boxes, only one answer can be processed and displayed at a time.

Kids become less frustrated with the computer when they understand its limitations and how it works. □

Jeffrey R. Lehman
Albany, NY

(continued)



Susan Gaber

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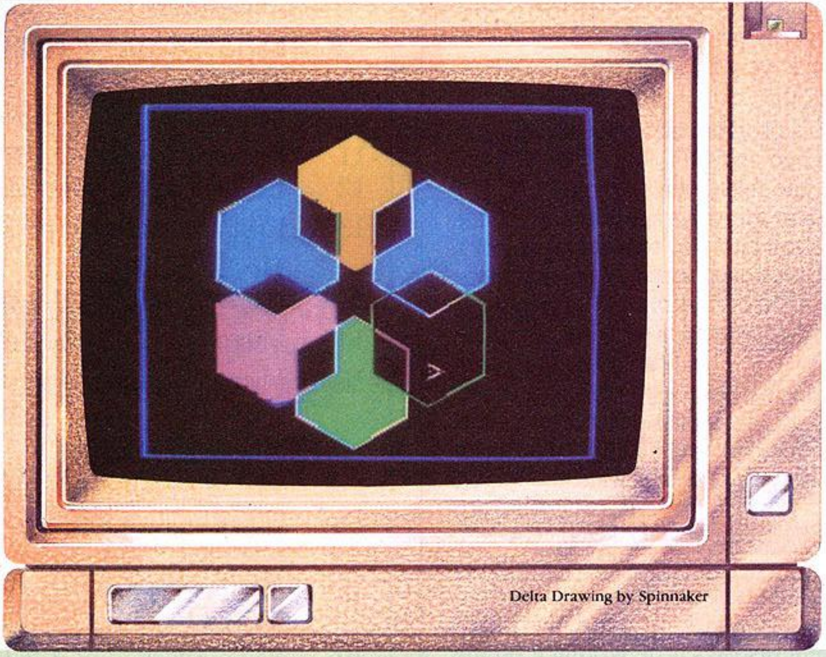

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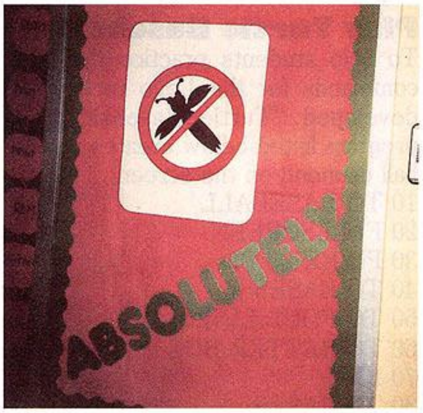
MICRO IDEAS

(continued from page 53)



Warn against bugs with a display.

Design a "No Bugs" Board

Working with a system that does not allow spelling or syntax errors can be frustrating. Just placing a period in the wrong spot can confuse the computer. To encourage my students to double-check every statement they give to the computer for spelling and syntax, I've decorated one of our bulletin boards with the words "No Bugs Allowed. Absolutely!"

Design a "No Bugs" symbol to go under these words. It's a large red circle with a diagonal red line through it, like the type you see indicating "No Smoking." Inside the circle place a construction paper bug. (The diagonal line must cross the bug.)

Now every time a student's progam does not work the way it should, the "No Bugs" board is a reminder to check the program for errors. ☐

Karen Weeks
Toledo, OH

Send Us Your Micro Ideas

Do you have computer activities, bulletin boards, or management tips you'd like to share? Send them to Micro Ideas, *Teaching and Computers*, 730 Braodway, New York, NY 10003. We'll pay $15 to $30 for each idea we publish and $5 for each quick, one-line tip we use. ■

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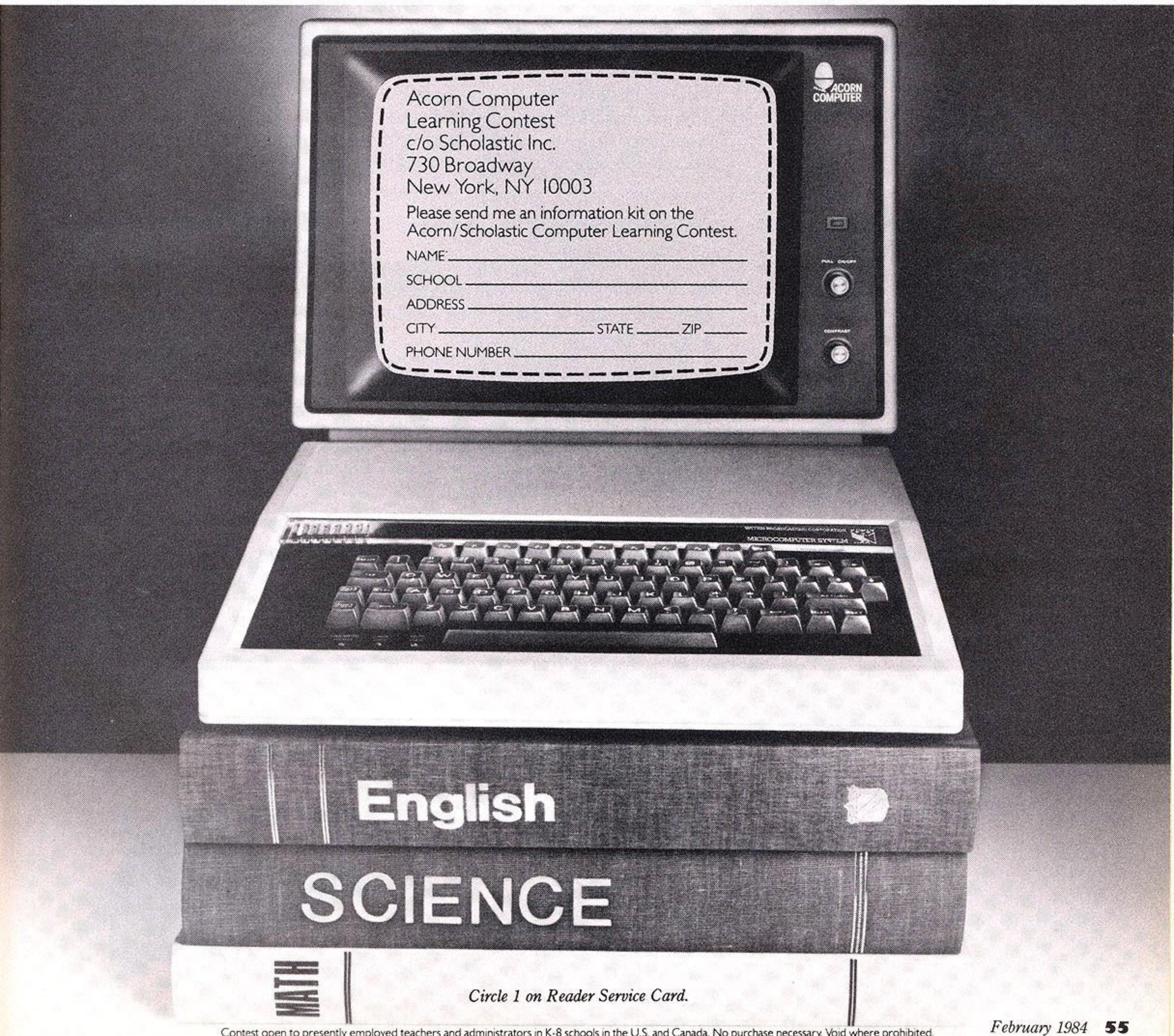

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Contest open to presently employed teachers and administrators in K-8 schools in the U.S. and Canada. No purchase necessary. Void where prohibited. All entries become the property of Acorn Computers, and cannot be returned.

LOGO NOTEBOOK

LESSON FIVE: Defining Procedures

By Tom Lough
and Steve Tipps

When parents give children commands like, "When you get to school, don't forget to give the teacher your lunch money," they involve the child in a two step process. First, the child must remember the command. Second, he or she must follow it at a specific time.

Programming involves this same two step process. In lesson five of Logo Notebook, students will first learn to instruct the computer to remember a set of commands (called *defining a procedure*) and then instruct the computer to carry out the commands by typing the procedure name.

1. The Name Game

Objective: Students create names for Logo drawings.

Activity: Cover a wall with a large sheet of butcher paper. Tell students they are going to enter their best Logo drawings in an art show.

Have them draw one or more of their drawings on the paper. Then explain to students that they must think of descriptive titles for their drawings in order to enter the contest. The only rule is that there be no spaces between the letters or characters of each name. Some examples are SQUARE, BIGCIRCLE, and SIXPOINTSTAR.

Explain that to make their titles easier to read, programmers separate words with periods. For example, they write SIX.POINT.STAR or SMALL.BOX.

Once students have titled their pictures, vote on first, second, and third prizes for the most descriptive title, the most imaginative, the weirdest, and so on.

2. Logo Lab Cards

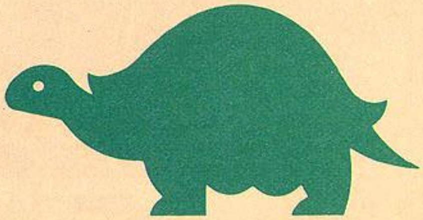
Objective: Students organize commands on note cards.

Activity: At the top of several three-by-five-inch index cards, write "From the Logo Lab of ____________ ____________." Give a card to each student.

Tell children to write their names in the blanks. Have them each pick one of their favorite Logo drawings and sketch it on the card. On the back, have each student write the name of his or her drawing and list the commands that produce the drawing.

The final product is a Logo Lab Card. Have students swap cards and try each other's "procedures."

Set up a Logo Lab Card file for the class. Have students choose a new card each day. They must reproduce the sketch on the front, using Logo commands. They can then compare their commands with those on the back. Sometimes students will use different commands to produce the same drawing. Explain that there are many ways to produce the same drawing in Logo, and no one way is right or wrong.



3. Editor at Work

Objective: Students change procedures in the edit mode.

Activity: To record, or define, a procedure in MIT and TI Logo, students must enter the *edit mode.* (Apple Logo allows students to define procedures without entering the edit mode.)

Explain that the edit mode is a special screen on which to record, but not execute, commands. Once you record a procedure, you can use the edit mode to change one command in the procedure, a bunch of commands, or even the whole procedure.

Make a large poster with commands for moving the cursor in the edit mode. (Check your user's manual for specific commands for your Logo version.)

Use the procedure below to give students practice in maneuvering the cursor in the edit mode.

```
TO CLEANUP
  MYDOG DOES NT HAVEFL EAS.
  TH ECA T MEWWWWWED ALLLLLL NIG HT.
  BOB ASKED GIRL THE FOR PENCIL A.
  ARE FUN COMPUTERS.
  END
```

Type in the procedure exactly as it appears. Exit the edit mode by pressing CTRL-C for Apple or MIT, and FNCT 9 for TI Logo. Save the procedure by typing SAVE "CLEANUP. Load the procedure into each computer and call up the editor. (Check your user's manual for specific commands for loading and retrieving Logo files.)

Challenge students to fix the words and letters in the CLEANUP program.

4. Proceeding With Procedures

Objective: Students define and save procedures.

Activity: Use a Logo Lab Card from the file to demonstrate how to define a procedure. (Type in the procedure, and then press CTRL C for Apple and MIT Logo, and FNCT 9 for TI Logo.)

To have the computer carry out the procedure, simply type in the procedure name, and press RETURN or ENTER.

Challenge students to define and carry out their own procedures, using the commands listed on their Logo Lab Cards.

5. Changing Procedures

Objective: Students change and edit procedures.

Activity: After everyone has defined at least one procedure and tested it to make sure it runs, tell students to bring up a procedure on the editor screen. (Check your user's manual for editing commands.)

Have a partner select a command to change. For example, the partner might say, "Change this line from RT 90 to RT 75." The author of the procedure makes the change, defines the new version of the procedure (CTRL-C for Apple and MIT; FNCT 9 for TI Logo), and runs the procedure to see what happens. (Type in the procedure name, and press RETURN or ENTER.)

6. The Name Game: Part II

Objective: Students learn to use precise names to accurately describe procedures.

Activity: Challenge students to write procedures to draw squares of different sizes. Here's a sample procedure for a large square:

```
TO SQUARE.80
  REPEAT 4 [FD 80 RT 90]
  END
```

At first, students will use procedure names like BIG.SQUARE, LITTLE.SQUARE, and MEDIUM.SQUARE. They soon discover, however, that they need more

(continued)

precise names to distinguish a small square from an even smaller square, for example, or to indicate the exact size of their BIG.SQUARE, as opposed to another BIG.SQUARE of their own or by a classmate.

Introduce some names, such as SQUARE.80, that indicate both the shape and the size of the drawing. The number 80 tells how far forward the turtle goes before turning right, as illustrated in the procedure above.

Extension: Have students write procedures with the following names: SQUARE.50, TRIANGLE.20, CIRCLE.10, and STAR.50.

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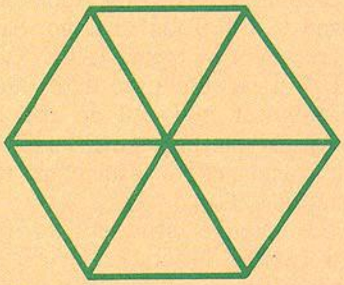
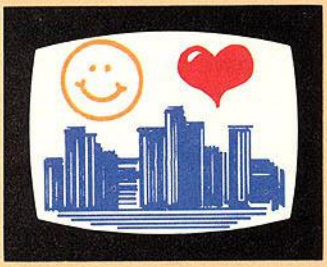
7. Procedures and More Procedures





Objective: Students use procedures within procedures.

Activity: By now, students should have a few simple procedures on their Logo Lab Cards.

On the chalkboard, draw pictures that use shapes from a number of different Logo Lab Card procedures. For example, ask students what procedures could produce the hexagon drawing at left.

After looking at everyone's Logo Lab Cards, the class might decide to use the following procedures:

```
TO TRIANGLE.30
  REPEAT 3 [FD 30 RT 120]
  END
TO DIAMOND.30
  REPEAT 2 [FD 30 RT 60 FD 30 RT 120]
  END
TO SHELL.30
  REPEAT 3 [FD 30 RT 60] RT 60 FD 60
  END
```

Here are some sample programs which use one or more of the triangle, diamond, and shell procedures to make the hexagon pictured above:

```
TO HEXAGON.TRIANGLE
  REPEAT 6 [TRIANGLE.30 RT 60]
  END
TO HEXAGON.SHELL
  SHELL.30
  BK 60 LT 60
  SHELL.30
  END
TO HEXAGON.DIAMOND
  DIAMOND
  LT 60
  DIAMOND
  REPEAT 2 [FD 30 RT 60]
  DIAMOND
  END
TO HEXAGON.ALLSHAPES
  SHELL.30
  RT 180
  DIAMOND.30
  FD 30
  TRIANGLE.30
  END
```

Give students a list of words that describe an object or color. Have students write a procedure to fit each word. For example, *red* might inspire a procedure that changes the background to the color red; *dog* might inspire a procedure that draws a dog. Have students type in sentences using the titles of their procedures. The Logo turtle will execute each procedure in turn, creating a dynamic illustration to go with the sentence.

For example, I LOVE CHICAGO might draw a face for the procedure *I,* a heart for the procedure *LOVE,* and a city skyline for the procedure *CHICAGO.*

In order to use words like *the, a,* and *and* in their sentences, students must define them as procedures. Have them type in just the beginning and end of the procedure, with nothing in between; the turtle will recognize the word as a procedure but won't act on it.

Here is an example:

```
TO THE
  END
```

Until next time, FORWARD 100!■

Tom Lough is editor of the *National Logo Exchange* newsletter, and ***Steve Tipps*** is assistant professor of education at the University of Virginia in Charlottesville, VA.

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NOTE: Each student who decides to participate, will at that time, be required to join **SWIG** at the reduced student membership fee of $5 (up to grade 8) or $10 (grades 9 & up).

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Circle 28 on Reader Service Card.

TOOLS OF THE TRADE

New and Useful Electronic Devices

Atari Kid's Controller

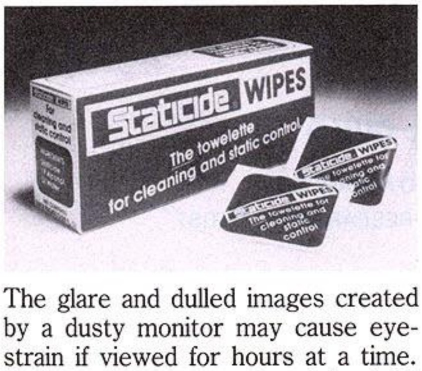
ATARI
KID'S CONTROLLER

Now even preschoolers can work video game controls with Kid's Controller. Atari and Children's Computer Workshop (CCW) developed this jumbo-sized keypad after research found that joysticks and other game controls are sometimes too difficult for younger children to handle.

The Kid's Controller works with the "Sesame Street" video games series created by Atari and CCW. Designed for children ages three to seven, the games develop reading, writing, and math skills with "Sesame Street" characters.

Price: $14.95 for Kid's Controller; $30.45 for each game. Contact: Atari Incorporated, P.O. Box 427, Sunnyvale, CA 94086; 408/743-4167. □

Staticide Wipes Reduce Eyestrain

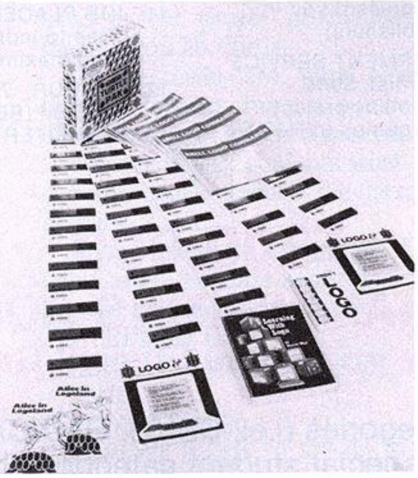


The glare and dulled images created by a dusty monitor may cause eyestrain if viewed for hours at a time. Staticide Wipes, developed by ACL Incorporated, clean your monitor while helping to prevent future dust from collecting.

Staticide Wipes are specially treated with deionized water and isopropyl alcohol. This solution helps eliminate static—a big dust attractor. Individually wrapped in foil envelopes, the towelettes are used once and then thrown away.

Price: $4.98 for a box of 24. Contact: ACL Incorporated, 1960 E. Devon Avenue, Elk Grove Village, IL 60007; 312/981-9212. □

A Logo Disk for Every Student



Krell's new *Turtle Pak* contains enough MIT Logo disks to give each student in your class his or her own copy of Logo. *Turtle Paks* are available in two sizes: the 20-disk pack or the 40-disk pack.

Along with the disks, *Turtle Paks* contain four Logo wall charts; two copies of an introductory disk and primer entitled *Alice in Logoland*; the reference book, *Learning with Logo*, by Daniel Watt; two *Logo and Educational Computing* journals; two utility disks with MIT programs, including *Dynatrack, Shape and Music Editors*, and *Sprite Driver Software*; and the MIT manual, *Logo for Apple II. Turtle Paks* are designed for Apple computers.

Price: $499.95 for the 20-Pak, $899.95 for the 40-Pak. Contact: Krell Software Corporation, 1320 Stony Brook Road, Stony Brook, NY 11790; 516/751-5139. □

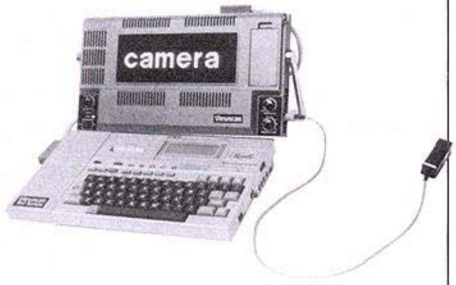
Timex Sinclair 2000

The Timex Computer Corporation has enhanced its computer line with the 2000 series by increasing its memory capacity to 48K RAM and expanding the number of characters permitted on the screen to 64. The 2000 series features high-resolution color graphics and fully programmable sound.

Software takes the form of minicartridges which plug directly into the computer.

Price: $149.00. Contact: Timex Computer Corporation, P.O. Box 2655, Waterbury, CT 06725; 203/573-5000. □

Text System for Visually Impaired



Visually handicapped computer-users can type letters, store text on microcassette tapes, and review text with the portable Viewscan Text System (VTS).

The system includes screen, computer, camera, and software. The use of neon orange letters on a black screen reduces eye strain.

Price: $6280. Contact: Wormald International Sensory Aids Corp., 205 West Grand Ave., Suite 110, Bensonville, IL 60106; 312/766-3935. □

Acorn Computer Comes to U.S.

Acorn, the microcomputer that captured 85 percent of the school market in England, has reached the United States. Acorn has 64K of combined RAM/ROM memory, a built-in word processor, speech synthesis, multichannel sound, high-resolution color graphics, and a local networking ability.

Some of the services and materials Acorn will provide educators include software, lesson plans, workbooks, teachers' notes, and in-service training programs.

Price: $995 without monitor or disk drive. Contact: Acorn Computer Corp., 400 Unicorn Park Drive, Woburn, MA 01801. ■

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MILLIKEN

THE SPELLING SYSTEM

```
dead     bread    young    health
blood    flood    touch    breakfast
heavy    thread   build    country

           ?
         L U B D I

TYPE THE WORD.  PRES
```

CLOZE PLUS

```
  The magicians [          ] their
audiences with their "magic."  People
couldn't figure out how it was possible
to do most of the tricks.  They were
always amazed by them.

5.  a. astounded   c. worried
    b. injured     d. warmed
```

MATH SEQUENCES

```
  1
 ²68
-197
  71

go on.
```

SENTENCE COMBINING

```
Example:
I have a dog.
She is friendly.

Watch:
I have a friendly dog.

That's how we use describing words
such as: red green fat thin quiet.

PRESS [SPACE] FOR NEXT PAGE.
```

EDUFUN! LEARNING GAME

```
BOB               SCORE:  BOS:0
FIRST? H                  JED:0
SECOND? H
EQUAL?
```

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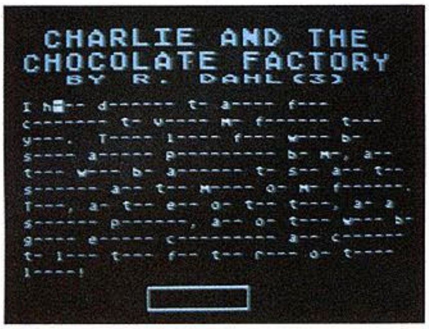
SOFTWARE SHOWCASE

Software Recommended for Teachers by Teachers

Missing Links: Young People's Literature

Computer: *TRS-80 Models III, 4; Atari (48K); Commodore 64; Apple; IBM PC*
Topic: *Language Arts*
Level: *Grades 3–6*

"-t w-s - l-ttl- -ns-ct, -b--t -n -nch l-ng -nd c-v-r-d w-th d-rt." That's part of a passage from *The Cricket in Times Square*, by George Selden. Students reconstruct the original passage by filling in the missing letters. Nine formats are available, including only the first letter or only the last letter of each word printed. Teachers (or students) can choose the number of players (one or two), the book, passage, format, and the maximum number of guesses for each blank (from one to five).



CHARLIE AND THE
CHOCOLATE FACTORY
BY R. DAHL (3)

Filling in the Missing Links.

Missing Links provides practice in using context clues, spelling, reading, and grammar skills. The teacher's guide provides copies of the outstanding children's literature selections used in the program and a reproducible student score sheet. The books used in the program are: *The Wind in the Willows; The Cricket in Times Square; The Lion, the Witch, and the Wardrobe; The Secret Garden; From the Mixed-Up Files of Mrs. Basil E. Frankweiler; Shadow of a Bull; My Side of the Mountain; Charlie and the Chocolate Factory;* and *Little House in the Big Woods.*

Before you use the program, ask children to read one of the nine books and report on it. Use *Missing Links* as a follow-up activity.

Type of Software: Disk
Price: $49
Policy: Backup included; 30-day preview
Source: Sunburst Communications, 39 Washington Ave., Pleasantville, NY 10570; 914/769-5030. ☐

Barbara Devir
Teacher
Woodside School
Peekskill, NY

Pipes

Computer: *Vic-20; Commodore 64*
Topic: *Social Studies, Math*
Level: *Grades 5–8*

You are a plumber. You must connect a pipeline from the water supply tank to every house. If you connect the pipes properly, there will be no leaks when you turn on the water. But you have a limited amount of money and pipe to work with.

Before you start to play *Pipes*, you choose the number of houses (1–5) that you want to connect. You select and move pipes from the factory to the houses with a joystick. The computer keeps track of how much money you spend and how much pipe you use.

This is an excellent supplemental activity to either a finance unit or a math unit that teaches linear measurements. There's a lot of thinking involved, and though some students may find it difficult, *Pipes* is a good problem-solving exercise.

Type of Software: ROM cartridge
Price: $34.95 for Commodore 64; $29.95 for Vic-20
Policy: 90-day money-back guarantee
Source: Creative Software, 230 East Caribbean Drive, Sunnyvale, CA 94086; 408/745-1655. ☐

Nancy Watson
Assistant Professor
Burris School
Muncie, IN

Addition and Subtraction 1

Computer: *TI 99/4A*
Topic: *Math*
Level: *Grades 1–2*

Two groups of elephants appear. The three elephants on the right join the two elephants on the left. The student sees the sentence "three plus two equals five" written on the screen in words and in numbers. That's the tutorial for "Addition Action," one of nine lessons in *Addition and Subtraction 1.*

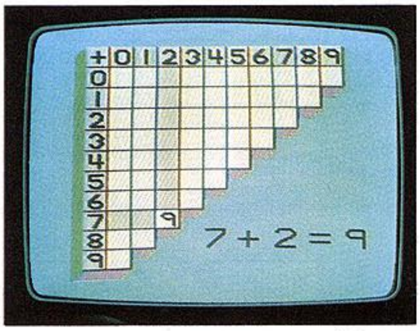
In other lessons, students count objects and learn to add and subtract. They get step-by-step help or advance to the next activity, depending on the number of problems they solve correctly.

Addition and Subtraction 1 is a well-designed program for beginners. Objectives and examples for each of the nine lessons are included in the teacher's guide, along with reproducible worksheets. Colorful graphics and fun sounds put the finishing touches on this excellent basic skills package.

Type of Software: ROM cartridge
Price: $39.95
Policy: No backup or preview
Source: Scott, Foresman Electronic Publishing, 1900 East Lake Ave., Glenview, IL 60025; 312/729-3000. ☐

Jim Alvaro
Teacher
Anchor Bay Elementary School
New Baltimore, MI

(continued)



Learning to add numbers on a grid.

Follow through...
with your help
to prevent
Birth
Defects.
SUPPORT
MARCH OF DIMES

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The Pond: Explorations in Problem-Solving

Computer: *Atari (32K); TRS-80 Model I, III; Radio Shack Color Computer; Commodore PET; TI 99/4A; IBM PC*
Topic: *Problem Solving*
Level: *Grade 2–Adult*

Children help a frog reach the magic lily pad by identifying and typing in a pattern that will make the frog jump through the pond without falling into the water. That's how to play *The Pond,* a game that teaches children about patterns, sequence, experimentation and logic.

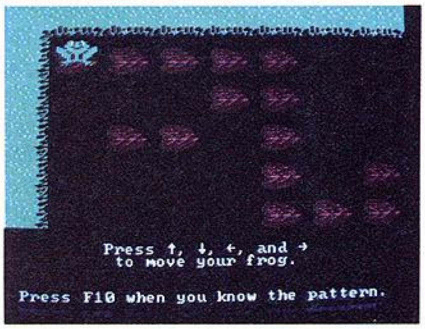
Students can practice by finding the pattern in "Farmer Jane's Ponds." Then they can try "Billy Bob's Ponds," "The Puzzle Ponds," or three more difficult levels. In the game mode, children get a maximum of 20 moves to discover three patterns at the level of their choice.

The game is excellent for exploring problem solving. But students need time to get used to it. I suggest having children work in pairs or as a whole class.

Teachers could include work with Pascal's Triangle or patterning in poetry while using this program. The documentation is very good and includes record sheets.

Type of Software: Disk for Atari, Radio Shack Color Computer, and IBM PC; cassette for others
Price: $49

Finding a pattern of lily pads for the frog to hop across in The Pond.

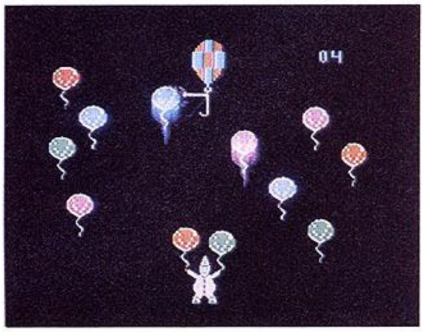


```
Press ↑, ↓, ←, and →
 to move your frog.

Press F10 when you know the pattern.
```

Policy: Backup included; 30-day preview.
Source: Sunburst Communications, 39 Washington Ave., Pleasantville, NY 10570; 914/769-5030. ☐

Beth Lazerick
Computer Education Coordinator
Shaker Heights School District
Shaker Heights, OH



The "Balloon Pop" game from Learning with Leeper.

Learning With Leeper

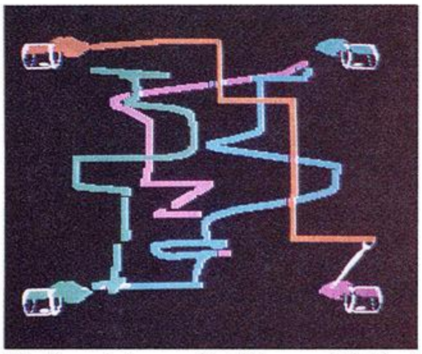
Computer: *Commodore 64; Atari; Apple*
Topic: *Thinking Skills*
Level: *Preschool*

Leeper is a funny looking creature that children control with a joystick. In "Dog Count," children help Leeper feed the dogs by finding the right number of bones. In "Balloon Pop," the child uses a balloon to match letters and shapes. The child moves a frog through a maze in "Leap Frog." And in "Screen Painting," the child makes designs on the screen using four colors.

The children in my preschool enjoy this program. They especially like to predict the number of bones the dogs need in "Dog Count." They like to play "Leap Frog," but even the lowest level of this game is difficult for them. After four months of using *Learning with Leeper*, my students still enjoy it.

Type of Software: ROM cartridge for Commodore 64; disk for all
Price: $29.95 for disk; $34.95 for cartridge
Policy: 60-day preview
Source: Sierra On-Line Inc., Sierra On-Line Building, Coarsegold, CA 93614; 209/683-6858. ☐

Nancy Barth
Director
Nancy's Nursery School
Fresno, CA



Making designs with "Screen Painting" from Learning with Leeper.

Juggle's Rainbow

Computer: *Commodore 64; Radio Shack Color Computer; Apple*
Topic: *Thinking Skills*
Level: *Preschool–Grade 1*

Juggles the clown uses a colorful rainbow, butterfly, and windmill to teach children how to match colors, recognize opposites and shapes, to count, understand spatial concepts, and use words to give directions.

Juggle's Rainbow comes with two

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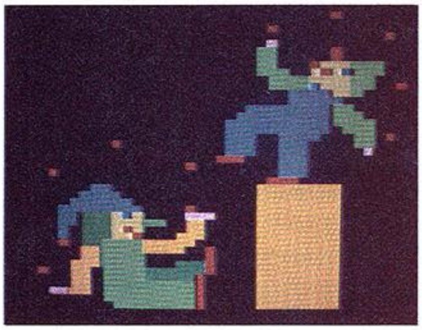

Clowning around with the juggling mascots of Juggle's Rainbow.

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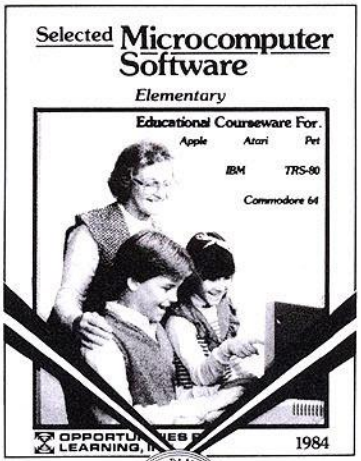

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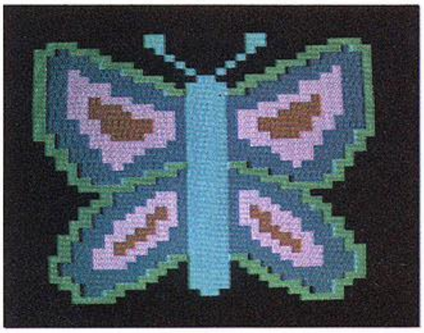


A butterfly teaches right and left in Juggle's Rainbow.

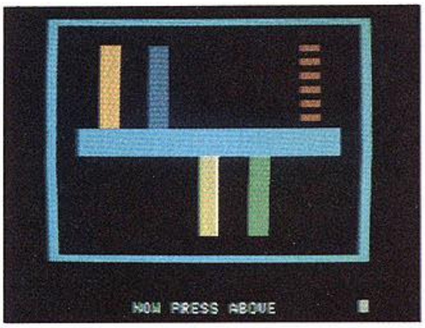
blue strips that teachers place on the keyboard to help kids distinguish directions. In the first game, children press keys above the blue strip to make colored arches and keys below the strip to make dancing rain. The second game teaches left and right with a butterfly. And all of the skills are united to create a windmill in the third program.

The teacher's manual is thorough and very clear in its directions. Some supervision is needed to get children started with this program. But after the takeoff, stand back and look out! The kids love *Juggle's Rainbow.*

Type of Software: Disk
Price: $29.95
Policy: Preview through dealers
Source: The Learning Company, 545 Middlefield Rd., Suite 170, Menlo Park, CA 94025; 415/328-5410. ☐

David Fiday
Laraway District 70-C
Joliet, IL

Juggle's Rainbow *teaches the concepts of above and below.*



Fractions Practice

Computer: *TI 99/4A; Atari 800; Apple*
Topic: *Math*
Level: *Grades 3-6*

Fractions Practice is a friendly and highly motivational math program for practicing fractions. The program has 10 activities. Students enter a number and press return to shoot a dart at a target. If the number is correct, a balloon pops and the fraction is marked on a number line.

The program gives excellent practice in precision and estimation.

Type of Software: Disk
Price: $60
Policy: Backup included
Source: Control Data Publishing Corporation, Inc., P.O. Box 261127, San Diego, CA 92126; 800/233-3784. ☐

Ann Dana
Microcomputer Consultant
Hinsdale Junior High School
Hinsdale, IL

ZTEXT

Computer: *Timex Sinclair 1000, 1500*
Topic: *Word Processing*
Level: *Grades 1-8*

ZTEXT lets you enter text, insert and delete text, and search for and replace letters and words.

Unfortunately, *ZTEXT* cannot handle lines longer than 32 characters at a time. Also, you must answer a cumbersome series of questions to print text. But *ZTEXT* is probably the lowest cost word processing system available. And students love it! With a little training, even first grade kids can use it.

Type of Software: Cassette
Price: $19.95
Policy: Backup included; preview through dealers
Source: Mindware, Inc., 15 Tech Circle, Natick, MA 01760. ■

M. Mark Wasicsko
Associate Dean
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Command Conversion Chart

Some of the articles in this issue of *Teaching and Computers* contain program listings that are written for a specific microcomputer. Use this conversion chart to modify programs for use on other machines. For more details on how to use specific commands, check your user's manual.

PROGRAM OF THE MONTH: *Black American History Quiz*

page 48 (Apple)

Machine	Lines	Conversion
Atari	Because subscripted string variables, such as C$(1), work differently on Atari computers, Atari program modifications for *Black American History Quiz* are extensive. For a complete listing of the program in Atari BASIC, send a self-addressed, stamped envelope to *Black American History Quiz* Modifications, *Teaching and Computers,* 730 Broadway, New York, NY 10003.	
Commodore	1, 130, 1020, 1120, 1150, 1200, 2010, 2090	Change HOME to PRINT CHR$(147)
Radio Shack	1, 130, 1020, 1120, 1150, 1200, 2010, 2090	Change HOME to CLS
TI	1, 130, 1020, 1120, 1150, 1200, 2010, 2090	Change HOME to CALL CLEAR

KID'S PAGE: *Beating Heart,* page 45 (Radio Shack)

Machine	Lines	Conversion
Apple	1, 100, 230	Change CLS to HOME
Atari	1, 100, 230	Change CLS to PRINT CHR$(125)
Commodore	1, 100, 230	Change CLS to PRINT CHR$(147)
TI	1, 100, 230	Change CLS to CALL CLEAR

LEARNING CENTER TASK CARD #19

page 39 (Apple, Radio Shack, Commodore, TI)

Machine	Lines	Conversion
Atari	1, 2, 3	Add these lines: 1 DIM A$ (10), B$ (10), C$ (10) 2 DIM D$ (10), E$ (10), F$ (10) 3 DIM G$ (10)

LEARNING CENTER TASK CARD #20

page 39 (Apple, Radio Shack, Commodore, TI)

Machine	Lines	Conversion
Atari	1, 2	Add these lines: 1 DIM B$ (7), D$ (8), F$ (5) 2 DIM G$ (3), J$ (3)

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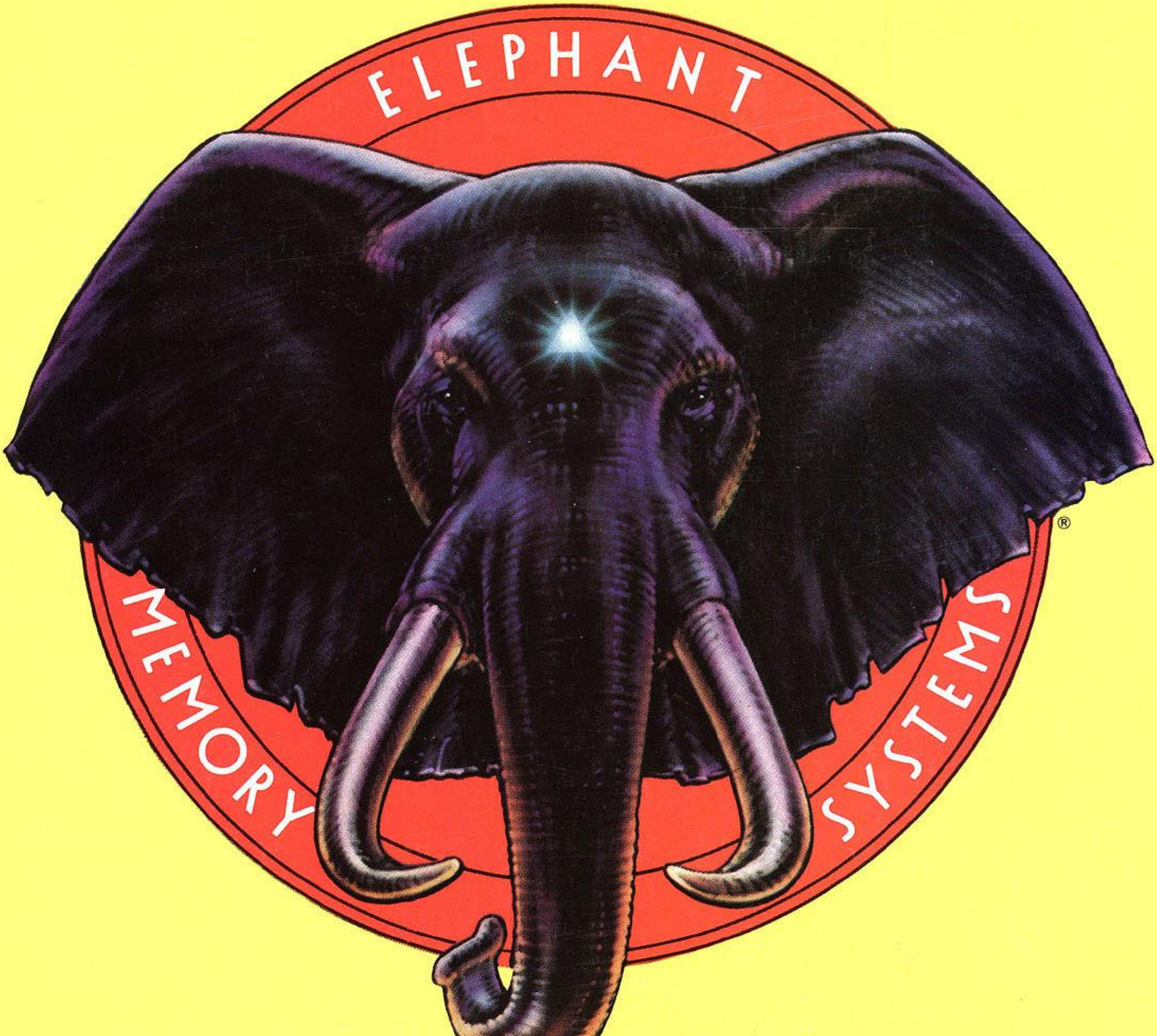

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